ORGAN INSTITUTE QUARTERLY

VOLUME 5 NUMBER 2 SPRING 1955

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ANDOVER MASSACHUSETTS

SCHNITGER ORGAN AT ZWOLLE, REBUILT BY FLENTROP, 1955.

ORGAN INSTITUTE SUMMER SESSION

AUGUST 1-20, 1955 ANDOVER, MASSACHUSETTS

FINN VIDERO, of Copenhagen, has been widely known throughout Europe for some time, but within the last two years his recordings have earned for him world-wide recognition as one of the greatest modern interpreters of baroque music. In ten master classes he will center his teaching around the music of Buxtehude, whose entire organ works he is now editing and will soon record. He will also teach excerpts from the *Little Organ Book*, and other works of Bach, Pachelbel, their contemporaries and forerunners, as registered students may request in advance of the session. His knowledge of the baroque traditions, with respect both to interpretation and registration, is unsurpassed in the world today, and his recordings, convincing evidence of his mature artistry, are among the current best sellers. His rapid rise has been phenomenal, but it is based upon sure foundations of profound musicianship.

A two manual, fifteen stop tracker action organ built by Hemmersam, similar to the one used by Mr. Videro for teaching and recording at Copenhagen, will be installed at Andover for use during the session.

CATHARINE CROZIER, noted for her performance of contemporary music, and especially that of American composers, will give a concentrated course of instruction in this field. In five class sessions it will include works selected from the following:
FRENCH. Langlais: Suite Médiéval (Salabert), Hymne d'actions de grâces "Te Deum" (Herelle), Arabesque sur les flûtes from Suite Française (Bornemann). Roger-Ducasse: Pastorale (Durand). Alain: Trois Danses from L'Oeuvre d'Orgue, Tome I (Leduc), Scherzo, L'Oeuvre d'Orgue, Tome I (Leduc), Litanies, L'Oeuvre d'Orgue, Tome II (Leduc),Le Jardin Suspendu, L'Oeuvre d'Orgue, Tome II, (Leduc). Messiaen: La Nativité du Seigneur (Leduc), Alléluias sereins d'une âme qui désire le ciel, L'Ascension (Leduc), Le Banquet Celeste (Leduc), Messe de la Pentecôte (Leduc).
GERMAN. Hindemith: Sonatas (Schott).
AMERICAN. Sowerby: Symphony in G Major (Oxford), Requiescat in Pace (H. W. Gray), Fantasy for Flute Stops (Gray or Oxford), Toccata (Gray). Simonds: Prelude on "Iam sol recedit" (Oxford or Fischer). Haines: Promenade, Air and Toccata (Fischer).

Selections from compositions of Purvis, Read, Kohs, Bingham, Donovan and others.

Registered students may request selections in advance of the session.

It has been said of Miss Crozier that her understanding of the various contemporary styles of composition is more complete than that of any other concert organist, and that she almost single-handedly has made the works of certain American organ composers popular with concert audiences. Under her hands contemporary music in the most unfamiliar modern idioms becomes lucidly transparent and assumes dramatic significance. In her concerts she will play modern compositions of which her interpretations, in concerts and recordings, are justly celebrated.

ARTHUR HOWES, Director of the Organ Institute, although widely known for his Bach recitals, has always insisted upon the study of romantic, in addition to baroque and modern, organ music, and has had long experience both in teaching and playing the nineteenth-century's organ classics. In his five master classes he will teach, in addition to the Bach *Schübler Chorale Preludes*, *Trio Sonatas*, and *Preludes and Fugues*,

the *Fantasia in F minor* (K 608) by Mozart, the *Eleven Chorale Preludes* by Brahms, the *Three Chorales* and *Piece Héroique* by Franck, and selected movements from *Sonatas* by Mendelssohn, *Symphonies* by Widor and Vierne, as registered students may request in advance of the session. He will also give a course in the essentials of organ design and construction, which will include a summary of observations made during the Organ Institute's tour of European organs in July. He will also present a graded list of teaching materials incorporating compositions of Buxtehude, Pachelbel, Lübeck, Scheidt, Krebs, and other composers whose works have become generally available within recent years.

Student requests for individual lessons from each of these instructors will be granted in so far as possible, but the schedule of master classes and concerts limits the number of lessons that any teacher can give. Students will be assigned to teachers in accordance with their repertoire and other requirements.

The curriculum will be supplemented by special courses in subjects that are of unusual practical value to organists and choir masters. It has been found that much can be accomplished in three weeks of concentrated effort in the two frequently neglected areas of improvisation and voice culture. As in the organ master classes, this instruction has been planned in such a way that students will acquire enough well-organized material for them to profitably utilize in practice through the following year. Both courses will be given in small classes with the maximum of individual attention.

ARTHUR E. HALL, who has achieved national prominence as a composer, having won the Society of Contemporary Music Award, the Organ Institute Composition Prize, and the Houston Symphony Society Award for the season 1954-55, will offer instruction in Keyboard Musicianship and Improvisation. As a preparation for improvisation, the keyboard musicianship work, based upon keyboard familiarity with all keys and scales, will include practice in transposition, harmonization of melodies and basses in all keys, and other practical work intended to equip organists with a full keyboard vocabulary. Improvisation will begin with the extension and development of simple melodies, and progress through combining melodies contrapuntally.

HOMER G. MOWE, one of this country's most distinguished voice teachers, has brought together from his wealth of experience a course dealing with the fundamentals of voice production that is intended to give choral directors the best possible perspective and insight in vocal matters. Class work and individual instruction will make organists familiar with the physical processes of tone production in such a way that their choral directing and instruction to choirs will gain immeasurably.

ARTHUR HOWES, Director of the Organ Institute, and conductor of the Fine Arts String Orchestra, former conductor of the Cecilia Society and Schola Cantorum in Boston, and the Bach Choir of Houston, and who has conducted the Boston Symphony Orchestra, will give a fourteen hour intensive course in the technique of conducting.

The purposes of this course will be two-fold. First, it will equip choir directors with definite and sure knowledge of the fundamental mechanics of conducting, the traditional movements of time beating and signals for attacks, releases, cues, accents, crescendos diminuendos, accelerandos, ritards and fermati. Second, it will attempt to develop in each student a range of expressiveness, a style of conducting that is appropriately indicative of a manner of performance. Methods of conducting various passages of music which involve all cases and problems will be discussed and assigned for practice.

All courses of instruction given at the Organ Institute are pre-eminently practical and valuable in the production of music. Theoretical considerations are brought into them only in justification of practice. All who have attended the Organ Institute seem to be agreed that the satisfaction which they have derived from it is based upon the consistently practical approach to music, with historical, philosophical and other theoretical considerations playing a supporting, secondary role. It should also be noted that the organ master classes, as well as the supplementary courses, are of value to students at whatever level of advancement they may have previously achieved. Each studies the particular pieces in which he is interested and which are suggested to him, while at the same time he learns from listening to the work of others. All can take notes on class work and apply the principles not only during their practicing and studying at the Organ Institute, but in the succeeding months and years.

In addition to the most valuable experience of playing for faculty criticism in the presence of a class, simply listening to the performance of others and to the comments of the artist instructors, who supplement their comments with full background details from their own research, study and experience, is of the highest value to all serious musicians. While the "seasoning" of performance under fire is to be recommended to all who have prepared any portion of the repertoire, it is nevertheless of almost equal value to be a non-performing member of the class. Whether or not a student registers as a performer or a non-performer may be decided in consultation with the Director.

The detailed analysis of repertoire, methods of practicing, style, and the interrelationship of practical features of organ tone and construction with registration and performance, are invaluable. The basis of the Organ Institute's program is the comparison of the ideas and practices of several different artist instructors.

Lodging and meals will be provided in dormitories and commons of Phillips Academy. Former students have frequently suggested that our announcement should emphasize the fact that these accommodations are pleasant and comfortable, and the meals unusually good. In fact, husbands and wives of organists who have accompanied regularly registered students have in several instances insisted upon returning to the Organ Institute because they enjoyed their vacation here. All points of historic and cultural interest in Boston (twenty-five miles distant), and the historic seaports Salem, Gloucester, Rockport, Newburyport (none more than thirty miles distant), and New England's finest bathing beach at Ipswich, offer unusual attractions to summer visitors. The White Mountains in New Hampshire are but seventy-five miles away; Andover is located close to nearly all points of scenic, historic and cultural interest in northern New England.

Practice facilities will be available for students in schools and churches of Andover, North Andover, Bradford, Haverhill and Lawrence. Many of the practice organs are within walking distance of Phillips Academy, but others are at a greater distance, so that it will be convenient for some students to come to the session in automobiles and use them for transportation to and from various organs.

Expenses, in addition to a $10.00 registration fee, will be as follows: Organ master classes (50 hours), tuition, concerts, lodging and meals, performer, $175.00; non-performer, $155.00; three private organ lessons (one hour each), $30.00; six, $60.00; six private voice lessons (one-half hour each), $30.00; nine, $45.00; Keyboard Musicianship and Improvisation (16 hours), $30.00; Voice Culture for Choir Masters (16 hours), $30.00; Conducting Technique (14 hours), $25.00; Practice organs (32 hours), $12.50.

★ ★ ★ EDITORIAL BRIEFS ★ ★ ★

AT THE CONCLUSION OF A MONTH-LONG CONCERT TOUR THE EDITOR FEELS AN irresistible impulse to make several general observations. The first is that there is now a constantly increasing number of good organs in this country. Our builders should be congratulated on the high quality of recent installations; it represents a commendably progressive attitude that has prompted them to seek and find new ways of improving their products. In a series of engagements across the length and breadth of the land (through 10,099 air miles) I encountered only one completely unmanageable organ, and it was quite old. The second is that even in the very best of recent work there is considerable evidence of the persistence of an old fallacy in the area of tonal design. This fallacy, which prevents many generally good organs from being really excellent, is the idea that the foundation tone, the 8′ manual stops and the 16′ pedal stops, should be of larger scale, and louder than, the upper work. Nothing could be more detrimental to the blending of tones at different pitches than an excessively loud foundation. In many good recent organs the well-voiced 8′ stops and well-voiced mixtures stand apart from each other, refusing to coalesce into a unified tone because there was too great a disparity between them both in strength and quality. A mixture is of little value in full organ if its effect is only that of a separate sounding high pitched squeak accompanying a fat and powerful 8′ tone. There must be *equality* (approximate), if a well-integrated composite tone is to be achieved. Why is it that the separate ranks of a good mixture blend together so well, so that they sound like a single voice when used as a solo or when added to a quiet 8′ stop? One of the reasons is that the different ranks of good mixtures are all approximately equal, both with respect to scale and voicing treatment. The 8′ and 4′ foundations should be matched to them and fitted in under them, in order to achieve a good "full" sound that is well integrated. The human ear, hearing a series of overtones of a given fundamental, "supplies" the fundamental even when no pipes are sounding it. The ear accepts strong overtones simply as brilliant foundation tone. When the foundation is sounded very powerfully at the same time disunity results; the effect is unpleasant. In many otherwise splendid instruments it is necessary to leave out loud 8′ stops, most often the Great 8′ Diapason, in order to obtain a good full organ sound. The idea of excessive 8′ predominance in full organ must be definitely and finally abandoned.

DERWENT M. A. MERCER, OF SOUTHHAMPTON UNIVERSITY, IS CURRENTLY engaged in acoustical research pertaining to jet engines. We earnestly hope that he can find a way to silence them, and the sonic boom as well. One of the few scientists to give serious attention to organ pipes, he has had the wisdom to perceive that the empirical procedures of pipe makers and voicers must be justifiable even though those craftsmen might be unable to explain them in scientific terms. This attitude, combined with Dr. Mercer's sure scientific approach and full background in the subject, are exactly the right ingredients for invaluable findings. We are preparing a list of acoustical problems in the field of organ design, construction, voicing ,et cetera, that need his attention. It is already lengthening! We hope that he can find time for them, and that we shall be able to publish his reports. His present article explains the production of tone in flue pipes and illumines other related matters.

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Published four times yearly — winter, spring, summer, autumn — by the Organ Institute at 104 Salem Street, Andover, Massachusetts. Price 50 cents a copy, annual subscription $2.00. Three years' subscription $5.00. Outside of the United States, $2.16 for one year, $5.48 for three years.

(Entered as second class matter at Andover, Massachusetts)

* * EDITORIAL

One particularly interesting point is clearly illustrated by his Figure 2. Recent discussions of nicking have been concerned with speech characteristics and attack noises of un-nicked pipes, apparently overlooking the presence of noise in the sustained tone. First thought might suggest the desirability of "refining" the tone by eliminating this noise. However it should be remembered that such noises accompany the tone of other instruments, notably strings. All sustained tones of a violin are played with vibrato; in a "straight" tone the noise is too prominent. The noise is unaffected by the vibrato, and the ear is attracted to the musical part of the sound because of the active or "live" quality imparted to it by the slight quivering movement. Also, the noises in musical tones do not carry as far as the regular vibrations that are strengthened by the instrument's resonance. The Philadelphia Orchestra itself is "noisy" up on the stage, but much less so beyond the first few rows of seats. Psychologically our enjoyment of musical sound seems to be increased when we are required to select or identify the part of it that has significance, which may be *slightly* obscured, as by celestes, or by reverberation. Tone that is too pure is too obvious, and consequently uninteresting.

A STUDY OF ARP SCHNITGER AND HIS organs, by William Leslie Sumner, author of *The Organ, Principles of Construction and Use*, begins in this issue. Following Ernst Flade's account of Gottfried Silbermann's life work, this series by the eminent Dr. Sumner will not only be of the highest interest to our readers, but will enable them to make comparisons between the two greatest figures in the history of German organ building.

BRIEFS ★ ★ ★

HENNIE SCHOUTEN, WHO WILL BE OUR guide in Holland, and has invited members of the Organ Institute touring party to his home, has given us some interesting background information about Dutch organs in his article appearing in this issue.

D. A. FLENTROP, THE NOTED DUTCH organ builder, in collaboration with Fenner Douglass, explains the principal tenets of his organ building Credo. It is especially interesting to us to learn that he considers the acceptance of certain limitations essential to artistic results. We heartily agree with this principle. He is sending a small organ to Andover for use in our Summer Session.

THE CLOSING DATE OF THE CONTEST HAS been advanced to May 30 (postmark). A preliminary examination of the entries received in March, identifying the first twenty-five themes and fragments, showed such a high percentage of accuracy that it seemed desirable to make the second set a little more difficult, in order to avoid a multiple tie that seemed inevitable. Accordingly a second set of plates has been made, and the themes from several less well-known works have been added, together with several more extractions from compositions in other media. It is hoped that a tie can be avoided; winners will be announced early in June.

Contestants who may be planning to make the European tour even if they do not win first prize should make their reservations immediately, as places in the party are becoming scarce. Prizes will be awarded by the judges without reference to anything but the contest answers.

HELMUT WALCHA, AFTER ACCEPTING the Organ Institute invitation to teach and play at its 1955 Summer Session, booked passage on a trans-Atlantic steamship and

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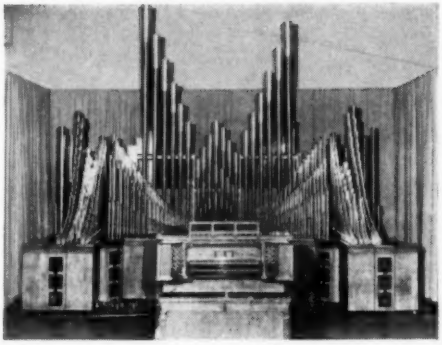
EDITORIAL BRIEFS

was informed, at that time, of the United States government requirement that all persons entering this country must have been vaccinated within the preceding three years. Mr. Walcha became blind in childhood during an illness that resulted from vaccination, and was subsequently excused from the usual vaccination at age twelve. After an examination and consultation, his personal physician forbade him to undergo vaccination at this time. The United States immigration authorities advised the Organ Institute that although it might be possible in ordinary circumstances to waive the vaccination requirement in the case of Helmut Walcha, at the present time it is impossible to do so because of the existence, in France, of a smallpox epidemic. It is necessary to announce, therefore, that he will not take part in the 1955 Summer Session, as previously planned.

At almost the same time of these developments word was received from Copenhagen that the noted Danish organ builder Hemmersam will send a modern tracker action organ, of the kind used by Finn Videro in his teaching and recording, to Andover for use during the Summer Session. This will enable Mr. Videro to explain and demonstrate his ideas more fully and exactly than would otherwise be possible, especially with respect to the traditions of baroque registration, on which he is a recognized authority. In consideration of these exceptionally favorable circumstances it has seemed desirable to extend the period of his teaching master classes from one week to ten days, so that organists in attendance may take advantage of the unusual opportunity afforded by the presence in Andover, not only of Mr. Videro, but of an organ designed especially to meet his requirements.



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LET it be understood by all correspondents and readers that the true purpose of our tour of European organs (lest any mistakenly feel that our interest in them and in articles by European authors implies disparagement of our own organ culture), is to ascertain whether or not the old organs there (we have none in this country) and the contemporary organs (quite different from our own) possess virtues that ought to be incorporated into modern American organs. Returning travellers have given such enthusiastic accounts of organs in the countries to be visited that all of us should want to "see for ourselves," if possible. Some say that the present trend toward the reestablishment of tracker action in Europe would never have started if the first class electro-pneumatic action that has become common in this country had been available in Europe. Others report the entire complex of interacting factors is essential to the more "live," "human" music that is possible with organs in which the player is not separated from the pipes by a long distance and myriad electrical circuits, and in which the voicing does not exceed the limitations of the older system. Since European organs are so different from our own, it is interesting and valuable to find out about their musical characteristics. No musical instrument can incorporate all virtues. The question is, which are the most important. Perhaps in the future European organists will tour this country to study our organs. If they do, we shall have to extend ourselves in every way in order to reciprocate the splendid hospitality that is being offered to us by our friends across the water.

* * * *

Admirers of Cecil Clutton on both sides of the Atlantic have protested against the reference to him, by detractors in his own country, as a "racing car enthusiast" and "collector of clocks." Well-informed readers indignantly aver that he most certainly is a recognized authority on organs, whatever his accomplishments may be in other fields, and we concur. It is our feeling that English organists and organ builders should heed the suggestions of Messrs Clutton and Downes (even though they may not agree on all points!) and other progressive leaders, if the organ in England is to become more than an expensive sound-effects machine and receive serious consideration as a musical instrument. Let everyone everywhere abandon an insular point of view; we have airplanes now! We must give unprejudiced consideration to new and unfamiliar ideas from any and all sources.

* * * *

Our geography being what it is, we are not certain whether our subscribers in Tokyo, Saigon, Bombay, or Cairo are furthest away from Andover, but we think Mr. W. A. F. Brodie, of Melbourne, Australia, is probably our most distant subscriber. The thought and spirit of his recent letter, however, bring him very close to the heart of the editor, who would like to share this satisfaction with readers.

> Dear Sir,
>
> In renewing my subscription to your most valuable and interesting Quarterly I would like to thank you for the great service you are rendering to the arts of organ building and organ playing. I am personally in your debt for many happy hours of reading and instruction.

I was amused at the controversy (?) on the beer barrel organ. For heaven's sake stick to your guns and don't be bullied out of your sense of humour. We have a wonderful word in Australia to describe the Stiggins or too pure puritan who frowns on fun. We call him a "wowser".

Yours sincerely,

W. A. F. Brodie, *Managing Director*

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Readers will also be interested and entertained by the reply to our facetious comments on "Hon. Englishman," written by the distinguished editor of *The Organ Club Journal*, London, G. G. J. Cooper, Esq.

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Arthur Howes, *Esq.*

Hon (1) Sir,

In your country where there are no Peers of the Realm, the designation 'Hon' seems to have only one Hon (1) meaning. I hope Hon (1) Sir, in this letter to point out the difference in this old country between Hon (1) and Hon (2). To our friends in the country which you so Hon.bly (1) occupy, Hon (1) only means Hon (1) and not Hon (2). In this country Hon (1) and Hon (2) are both designated by the letters H.O.N. — one of those abbreviations which seem to be the curse of modern jargon. Now, Hon (1) Sir, although every member of the Organ Club is (we hope) Hon (1), the officers are generally Hon (1) as well as being Hon (2) — by virtue of their not receiving any salary or emolument for the work they do; everything is purely voluntary and this is shown by the title Hon (2). Whilst your category of Hon (1) Vice-President through the gamut to Hon (1) Englishman is doubtless true, in our case all 'Hon's' are really Hon (2). There cannot be such a person as an Hon (2) Englishman!

Best wishes,

Your Hon (1) servant.

G. G. J. Cooper — *Hon (2) Editor.*

Hon (1) = Honourable. Hon (2) = Honorary.

May all organists ever be Hon. (1) but never Hon. (2)!

M. A. VENTE

THE CAPPEL ORGAN

In his article in the Winter Issue Dr. Vente alluded to the widely held, but in his opinion erroneous, belief that the organ made famous by Helmut Walcha's recordings had been built by Schnitger. A flood of correspondence followed immediately, and Dr. Vente has kindly provided an explanation.

I shall be pleased to give further details of my opinion about the Cappel organ. I saw this instrument in 1953; from the very first my reaction was that this was not a Schnitger organ, in particular my attention being drawn to the character of the flutes. The organist of the church was so kind as to show me the interior of the instrument, and then it became apparent that the pipework could only be of a much earlier date than 1686, the year in which — as is surmised — Arp Schnitger built this organ. When I heard that this organ originally came from a Hamburg church I thought at first that this pipework must have been made by Hendrik Niehoff and Jaspar Johansen of 's-Hertogenbosch (Brabant, Holland), craftsmen who built new organs in Hamburg and Lüneburg about 1550. When afterwards it appeared from the archives that in 1567 something had been done to this organ in the Hamburg church where the Cappel organ came from (what exactly happened no one knows), I became convinced that in this year, 1567, the essential part of the present Cappel organ was made, viz. the greater part of the pipes. Since both Niehoff and Johansen were already dead in 1567 and their work was continued in Hamburg and its surroundings by the Scherer family from Hamburg, it is only logical to assume that one of its members built this organ himself. With this a tradition of ages, already voiced by Michael Praetorius, has become established, viz. that the "Hamburg organ builders," working from about 1550, continued the work of the Brabant school. The relationship appears clearest from the shape of the old pipes and from the scales, essentially similar to the pipe material remaining in Holland itself from the sixteenth- and seventeenth-century Brabant school.

My opinion is made sure by that of the organ builder P. von Bekkerath of Hamburg, who looks upon this organ as the work of Dirich Hoyer, son-in-law of Jakob Scherer. My opinion about the age of the pipework is shared by Mr. Henry Willis from London, with whom I visited this organ in 1953.

Finally there is still another argument, which strengthens my opinion. In the organ at Neuenfelde near Hamburg (in the church where Arp Schnitger is buried) we have quite similar pipework (though in a much smaller quantity) as in Cappel. This very old pipework at Neuenfelde is not Arp Schnitger's, but was put in this organ in the twentieth century by the Lübeck organ builder Kemper, who had kept these old pipes from a dismantled Scherer organ.

Further we know that Arp Schnitger and his sons repeatedly put pipework from an older in a so-called new organ, as in Groningen A-church, Alkmaar Saint Laurens, Hamburg Saint Jakobi, et cetera.

It is likely, though, that Arp Schnitger somewhat altered this Cappel organ in 1686.

As far as I have been able to observe, the Cappel organ has been built in:

(A) 1567, Dirich Hoyer.

Rückpositiv	*Hauptwerk*	*Pedal*
8′ Hohlpfeife	16′ Quintaden	16′ Untersatz
8′ Quintaden	8′ Rohrflöte	8′ Prinzipal
4′ Rohrflöte	4′ Oktave	4′ Oktave
2′ Oktave	4′ Spitzflöte	2′ Nachthorn
1 1/3′ Sifflöte	2′ Gemshorn	Mixtur
Some ranks of the Scharff,	Most ranks of Rausch-	Rauschpfeife
Terzian, Sexquialter,	pfeife and Mixtur,	16′ Posaune
16′ Dulzian	8′ Trompete	8′ Trompete

(B) Between 1567 and 1686

Rückpositiv	*Hauptwerk*
4′ Prinzipal	2 2/3′ Nasard
	Chests, either from 1567 or from between 1567 and 1686. Most parts of the action and keyboards

(C) 1686, Arp Schnitger

Rückpositiv	*Hauptwerk*	*Pedal*
Some ranks of the Scharff	8′ Prinzipal	2′ Cornet
	Zimbel	Some pipes of the 16′ Untersatz
	Some ranks of Mixtur and Rauschpfeife	The case
		The present specification
		The present pitch

(D) Modern

Rückpositiv

Some pipes of the Scharff

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★ ★ ★ A MATTER OF RECORDS ★ ★ ★

THOMAS P. FROST

ALL other efforts at obtaining truly high fidelity in a phonograph are futile if projected through inadequate loudspeakers. The most painstaking recording, the finest needles, cartridges, and amplifiers are wasted in a considerable degree if the loudspeaker and its enclosure are not of high quality. The speaker, as is well understood, converts the electrical output of the amplifier to audible sound waves. In doing this it may emphasize or suppress certain frequencies; it may cut off the extreme treble or bass; and may introduce distortion and harshness. Most speakers are subject to these defects in considerable degree, for unfortunately the loudspeaker is the least perfected element of a phonograph system.

There are extremely fine speaker systems on the market today, but their cost and size are comparable to a spinet piano. The impression of the writer has been that anything much less is distinctly a compromise; and consequently the greatest care in selection and the soberest balancing of cost versus tone of various speakers is warranted. (As a rule of thumb the speaker and enclosure together should roughly equal in price the rest of the system.)

Probably the only way to determine whether the tone quality of a given loudspeaker and enclosure is adequate is to listen to it, comparing it to other speakers, and preferably repeating the test many times with a variety of music. There is no use in trying to do it in haste. The familiar, relatively standardized tone of the piano is perhaps the most revealing for this purpose. If organ music is a prime interest, the effect of various good recordings should be carefully observed; and in any event the organ will test the lower and middle frequency response unusually well. The medium-high frequencies can well be observed in singing, particularly solo.

It will be found in comparing speakers that some render the full bass, while others produce a deceptive semblance by a strong response on certain notes, and still others respond too lightly or not at all in the lowest notes. Another difference which will be observed lies in the directional nature of the sharpest high-frequency sound. On some speakers little difference is apparent between the tone quality at one point and another in front of the speaker. In others it will be found that the highs seem to emerge from the speaker concentrated in a narrow cone. This, of course, is disturbing because of the change in tone quality which occurs with a change in location. These points can best be heard if the listening tests can be made with loud sounds, for all of the defects of the speakers are then much more readily apparent.

The speaker and its enclosure must really be considered together, for the enclosure exerts a very important effect upon the sound quality. A speaker which produces a rich, full bass when mounted in an enclosure would normally lose its depth if removed from it. The enclosure may loosely be considered as a sort of resonator and sound-chamber which assists the speaker to develop its potential bass response and project it into the air. It may be simply an "infinite baffle," as in the case of a speaker mounted in a wall. The infinite baffle prevents the long bass sound waves from the back of the speaker from running around front and cancelling the sound waves from the front of the speaker. The "bass reflex," "corner horn," and other types of enclosures have been

developed to accomplish the same end in a more refined manner, and in less space. The writer has had some experience with the small enclosure known as the "R-J," and can recommend it for home use where space and funds alike are limited. As a point of departure, size is an indication of quality in a speaker enclosure: the bigger, the better.

A final caution: too good a speaker can make audible certain defects in a phonograph (such as amplifier distortion or turntable rumble) which a poorer quality speaker would not transmit. In such a case, the speaker ought not to bear the blame for the resulting sounds.

SAMUEL SCHEIDT, Selections from the TABLATURA NOVA. LUTHER NOSS, organ. OVERTONE LP 3, 12".

The rising Baroque in Germany found many musicians of great talent in its service. None was more justly famous than Samuel Scheidt (1587-1654). He is credited with the first idiomatic settings of the chorales for organ, and the first book of organ accompaniments for Protestant congregational singing (*Tablaturbuch hundert geistlicher Lieder und Psalmen*, 1650). A pupil of Sweelinck, the "maker or organists," Scheidt followed his master in composing many works which exhibit a high degree of contrapuntal skill. His most important work, the *Tablatura Nova*, appeared in 1624. This remarkable collection was the embodiment of the nascent baroque, much as Bach's *Art of Fugue* was the fulfillment of the mature baroque. It would be a condescension in the face of genius to regard this as merely the work of a "forerunner." From this collection, the present works have been selected.

In spite of the decimations of the Thirty Years' War, the early years of the seventeenth century witnessed a great vigor in German Protestant church music. Only in the church could the public at large hear professional performances of music; and the solemn melodies of the beloved chorales were to many folk in those troubled days a sacred promise of the tranquillity of the hereafter. Small wonder that the chorales became the basis of a musical art whose vitality would outlive the religious climate which gave it birth.

The first half of this record is devoted to two sets of chorale variations, "Warum betrübst du dich, mein Herz" and "Da Jesus an dem Kreuze stund." Upon them are lavished all that could be asked in dedicated performance. Noss' approach is a properly formalistic conception of music which essentially consists in contrapuntal ornamentation of the *cantus firmus*, and is not burdened with unnecessary changes of registration, dynamics, or tempo. He strikes a fine balance in tempi, avoiding both the appearance of pedantic restraint and virtuoso show for its own sake. Moderate ritards are naturally executed at the conclusion of major sections. The registrations are well-contrasted and apt to the individual variations. Stops are changed only between variations, with pungent solo combinations frequently assigned the *cantus firmus*. This music is more than deserving of performance today, and is well-suited to use in worship services, a point which will interest many organists.

A surprise greets the listener on the opening of the second half, as a choir of men's voices alternates with the organ in the verses of the Magnificat. The delightful secular variations on "Est-ce Mars?" which conclude the recording are brilliantly played on the small apse organ.

The Battell Chapel organ at Yale University, on which this recording was made, is an outstanding example of the work of Holtkamp. The writer recalls it as perhaps the most satisfying of the numerous fine instruments of this builder which he has been

privileged to play, with unusually cohesive ensembles and fascinating reedwork. The main or transept organ boasts three complete manual divisions and a large independent Pedal, 57 ranks in all. The Great affords a wide selection of pitches, from the two 16′ registers to the two mixtures. The Swell is the only enclosed division, the Rückpositiv occupying the traditional position at the performer's back projecting further into the building than the rest of the organ. The apse organ is a separate two-manual and pedal instrument of a dozen ranks intended primarily for accompaniment of the choir.

The voicing of the flue pipes exemplifies the traditional "chiffing" or "lipping" attack which adds so much vitality to this music. The reed voices are mostly of the prompt, colorful variety often called "baroque" for want of a better name, and can be used for solos or for coloring the ensembles without obliterating the polyphonic lines. In the Pedal particularly they incline to buzz; but as Noss uses them they are an invaluable asset in the tonal pallette.

The complete stoplist of the organ is given in the erudite and informative program notes; and the only improvement we could suggest would be a detailed listing of the registrations. The recording, as we nearly forgot to mention, is technically of very high quality, well-balanced, and undistorted.

A. GUILMANT, Sonata No. 1 in D minor, Op. 42. J. REUBKE, Sonata on the 94th Psalm. RICHARD ELLSASSER, organ. M-G-M F3078, 12″ LP. $4.85.
C.-M. WIDOR, Symphony No. 6 in G minor, Op. 42. RICHARD ELLSASSER, organ. M-G-M E3065, 12″ LP. $4.85.

It would be unreasonable to berate a musician for adhering to musical practices which are going out of favor. Did not Bach in his latter years do just this? On the other hand, it is lamentable when a well-known performer pursues decadent traditions from the era of the organ's disrepute.

The virtuoso performances on the present records are in the theatrical manner, played on an instrument lavishly appointed to deal with this sort of interpretation. How regrettable it is that inaccurate playing often accompanies the appropriation by the performer of the right to depart arbitrarily from the manifest intentions of the composer. In this connection the staggering pedal triplets at the conclusion of the Reubke may be remarked. (If the composer's other directions are not respected, why should it matter whether he indicated triplets or some other assorted note-values?) The non-coincidence of the voices upon principal beats in the Guilmant Adagio is likewise distressing.

The renditions would doubtless be of interest to Messrs. Widor, Guilmant, and Reubke, who probably never heard anything of the sort. These men were all of the era we call romantic, but the French composers were traditionalists whose work actually helped to prepare the way for the world-wide classic revival. Whatever else may be said of Reubke, it is certain that the German organ of his time was not overloaded with orchestral imitative voices and celestes. Beyond the right of each performer to re-create the music anew, there is no valid justification for the extremes of registration and tremulation, of dynamic and rhythmic effects employed throughout much of this music.

The Hammond Museum organ, upon which these brilliant performances have been recorded, is of the first magnitude in size. Many will recall with pleasure Joseph Bonnet's recordings of a decade ago which were made upon it. Even an extended program on this instrument would not require the repetition of a solo voice, although in the present records little advantage is taken of this luxurious diversity.

Ensembles in such an instrument all too often amount to a glutinous agglomeration of foundation stops, topped by out-of-tune trebles coming through the octave couplers. In bigger ensembles the blanket of tuba tone tends to blot out the rest. Many players are not at their best on so large an instrument because they registrate with too many stops and fail to take advantage of the stops singly and in small groups.

The acoustics of the hall, which in the days of dead studios seemed desirable for recording, today appear rather unsympathetic. The recordings technically are adequate, if not outstanding.

The Reubke Sonata was reviewd in another recording in the Summer, 1954, *Quarterly*. Both Guilmant and Widor have been too long neglected in records, and it is fortunate that these of their works are now available. The Widor disc is the first of a projected series to include all of the "Symphonies," and it is certainly to be hoped that more will soon be released. The value of such recordings can be enhanced by increased attention to authenticity.

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OLD DUTCH ORGANS

THE Netherlands is rich in fine, old organs. Foreign organists, visiting our country, are generally first attracted by the large baroque organs at Groningen, Zwolle, Alkmaar, Haarlem, and Amsterdam, built by Arp Schnitger and his pupils in the first half of the eighteenth century. On examining a greater part of old Dutch organs they soon discover that, though Schnitger and his pupils led organ building in the Netherlands to a culmination point, there still exist many most interesting organs dating from the sixteenth and seventeenth century.

In the sixteenth century organ building in the Netherlands was developed to a high degree. Dutch organ builders were highly esteemed in France and Germany and young Germans came to Holland eager to learn the art of organ building. Some four-hundred-years-old organs are still existing, e.g. the organ at Oosthuizen (1521), the choir-organs in the Laurenskerk at Alkmaar (1511) and the Nieuwe Kerk at Amsterdam (1560).

In the seventeenth century hundreds of organs were enlarged or replaced by new ones. Germer Galtus, Hagerbeer, Duyschot and other organ builders enriched numerous churches with fine instruments. On playing the organs in the Pieterskerk at Leiden, the Nieuwe Kerk at The Hague and the Westerkerk at Amsterdam, one is convinced that the Dutch organ builders of the seventeenth century joined excellent craftmanship to real artistic taste. They designed a complete Principal chorus on the Hoofdwerk (Great Organ) and the Rugpositief (Back-positif), they provided a judicious proportion of principal stops and flute stops, of foundation tone and upper work. Their organs sounded rather softly, clearly and sparkingly, but they lacked a sufficient number of reeds and a pedal tone powerful enough to support the full manuals.

These organs, however, were quite suitable to the performance of the Dutch organ literature of the seventeenth century. Sweelinck composed his toccatas, variations and phantasies for "organ or cembalo." Compositions which can be played as well on the cembalo as on the organ do not require richness in constrasting timbres and an imposing pedal foundation.

In the meantime organ building and organ composition in Germany reached an astonishing height. Composers like Buxtehude, Bruhns and Lübeck created compositions requiring large organs of rich design with splendid reeds and a pedal containing powerful 32′ and 16′ stops as well as fine solo voices. Our Dutch organ builders were not equal to the new demands, but fortunately there was an outstanding organ builder in Germany, who was interested in building organs in Holland. He was called Arp Schnitger, and would probably have shrugged his shoulders unbelievingly if somebody had told him that his name would become famous in organ history and that after centuries organists from everywhere would cross the oceans to play the organs he was making. Schnitger needed more work and was quite willing to build organs in the Netherlands, the little, rich country on the North Sea.

For Holland was a rich country at that time. Dutch ships crossed the oceans and came home loaded with riches from the Dutch East Indies. Wealthy merchants had

huge mansions built on the Amsterdam canals and had their pictures painted by famous Dutch painters. There was wealth in Holland and no need to be economical. People were glad to pay large sums to organ builders who could supply the churches with important instruments. Besides, the greatest architects and the best sculptors were invited to design the organ cases. We cannot be thankful enough that just at that time Arp Schnitger and his pupils came to our country.

In 1692 Arp Schnitger rebuilt and enlarged the organ in the Grote Kerk at Groningen. His fame soon started to spread. He built several little organs, especially in the Northern provinces of Holland; in 1721 his sons rebuilt and enlarged the organ in the Grote Kerk at Zwolle and in 1725 that of the Laurenskerk at Alkmaar. Schnitger's pupils provided numerous churches with beautiful, large organs. J. C. and Chr. Müller built organs at Leeuwarden, (1727) and Haarlem (1738). Rudolf Garrels is known by the organs he built at Maassluis (1732) and Purmerend (1742). Chr. Vater built a magnificent organ in the Oude Kerk at Amsterdam. In the first half of the eighteenth century only one large organ was built by a Frenchman: that in the Janskerk at Gouda, built in 1736 by Jean Moreau.

The influence of Schnitger was still felt as late as the nineteenth century. Though in the century following the Schnitger period many beautiful organs were built in Holland, organ building reached its culmination point in the first half of the eighteenth century.

The main reason why we are so happy with our organs from the Schnitger period is that these organs enable real performances of the compositions of Bach and most of his predecessors. Owing to the research work of some organ historians in the last twenty years we are much better informed about the history of registration than we were at the time when Schweitzer and Pirro published their books on Bach. Though German composers of the seventeenth and eighteenth centuries seldom added registration prescriptions, we now have a rather clear insight in the principles of registration followed by the baroque composers.

We know that the term "Organo Pleno" had not exactly the same meaning in Praetorius' time as in Buxtehude's time. We know something about the principles the old masters followed combining voices of large with those of small scale. We know in what cases the combination of stops of the same pitch was allowed, in what cases large-scaled mutations were used, in what cases they were excluded, et cetera.

And though we still want to know more about the history of registration, we are now able to build our interpretations upon a much firmer historical foundation than we were a quarter of a century ago.

It is most disappointing if an organist who has made a profound study of registration in the works of Bach, and hears these works sounding in his mind's ear, never has an opportunity to play upon an organ which is suitable to the performance of these works. Therefore one can understand the emotion of the Vienna organist Anton Heiller, who, playing upon the organ in the Laurenskerk at Alkmaar for the first time, deeply touched cried out: "Now I can play Bach for the first time in my life."

The Alkmaar organ is one of the most outstanding old organs in Holland. But, as I already pointed out, there are many fine, old organs in our country, where organists, playing works of Bach and other baroque composers, can spend fruitful and happy hours.

The Bavo Kerk in Haarlem, where the International Improvisation Contest will be held, July 6, 7, and 8, 1955.

D. A. FLENTROP and FENNER DOUGLASS

THOUGHTS ON ORGAN DESIGN IN THE NETHERLANDS

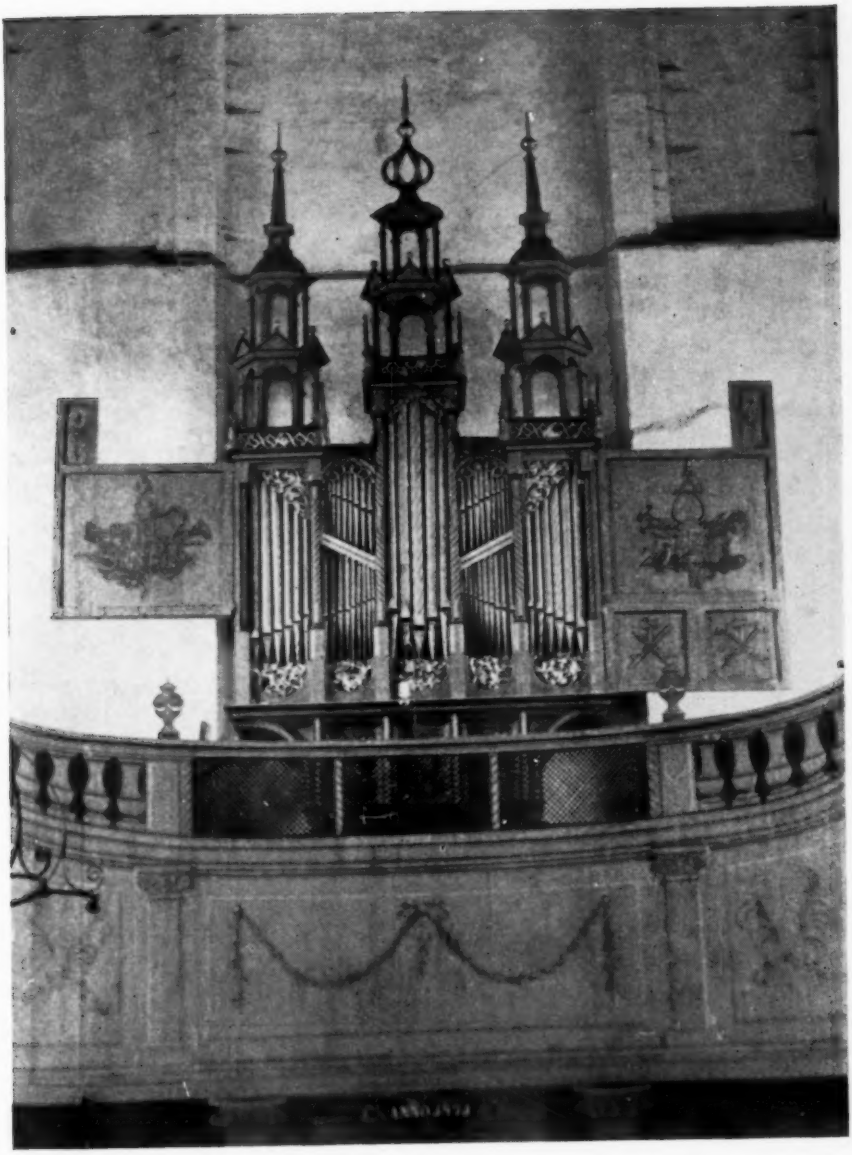
RECENTLY there has been increasing interest on the part of American organists in the organs of Holland, old and new. For such a small country, the percentage of well-preserved instruments from the sixteenth century to the beginning of the nineteenth century is very large. And today the efforts of Dutch organists and organ builders are directed conscientiously to the preservation of these numerous monuments for future generations. The influence of such a heritage on contemporary instruments is, of course, very great.

In the preparation of these comments, it has been foremost in the minds of the writers to present a practical aid to the organist traveller, and to assist him in understanding the various artistic principles which are, and have earlier been, at work in the development of the Northwest European Tradition. The reader will then be guided to four organs of various sizes, two old and two contemporary. These instruments might serve as a nucleus for an organ trip which could easily be expanded to include any number of organs, many of which are famous and familiar to all. Such well-known Dutch organs as those in Alkmaar, Haarlem, Gouda, and the Old and New Churches in Amsterdam need hardly be mentioned, thanks to several fine articles already printed in American journals. And they all deserve a visit.

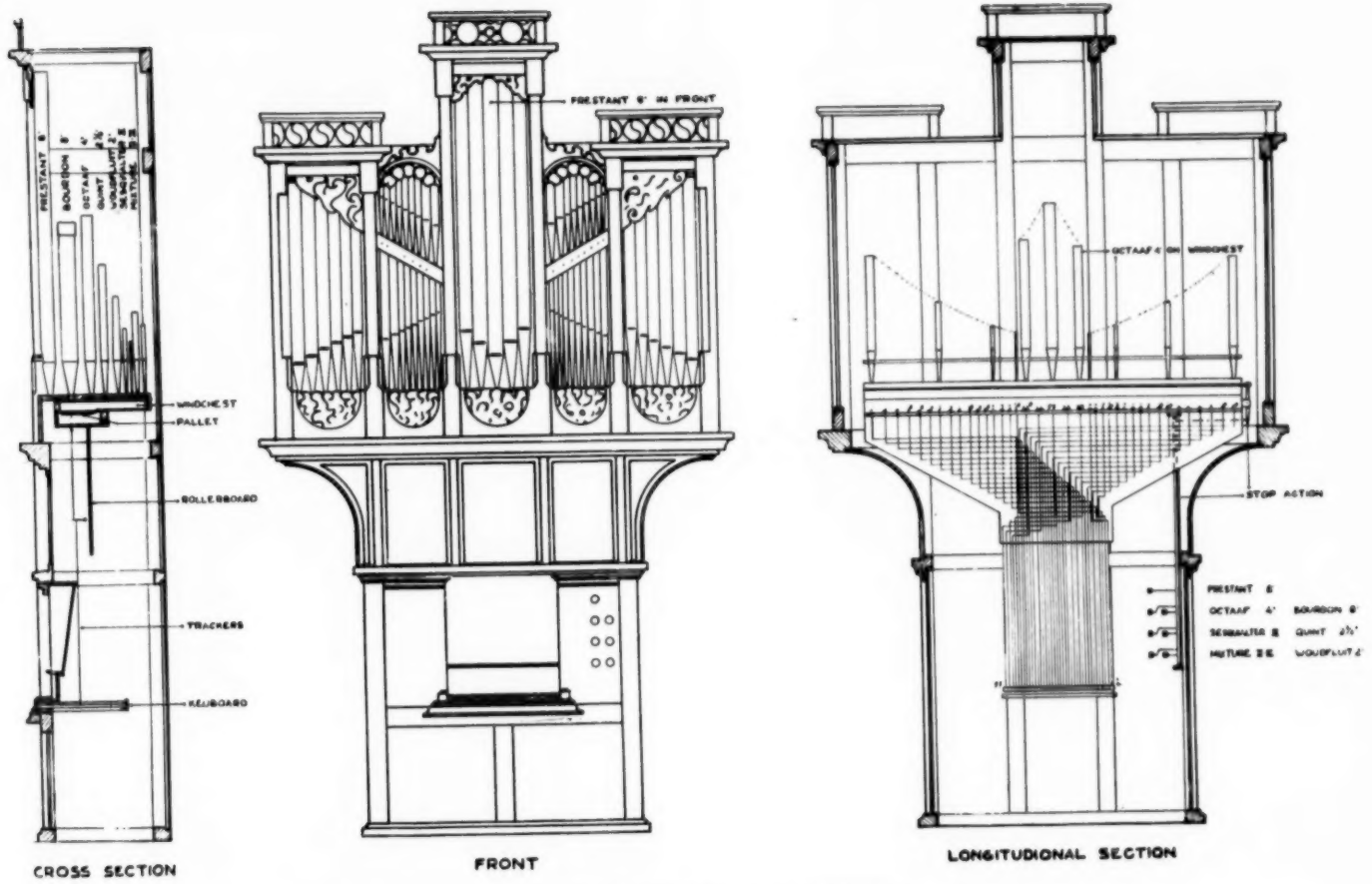
The reader's attention is first directed to a small town in the Province of North Holland, not far from Alkmaar and Amsterdam. In Oosthuizen, is an old, rickety church which is sagging at the seams and leaking when it rains. Placed on a narrow gallery with an absurd wooden railing painted to look like a classic veranda, is a small, one manual organ from the sixteenth century. The instrument has survived more than four hundred years with a minimum of tampering. Its wind chest, keyboard, action, and nearly all the pipes are original. In fact, it does not even have an electric blower. The sounds, were it possible to reproduce them on the printed page, would surely interest the reader in pursuing the course of history, and in coming to some understanding of what makes such an instrument outstandingly musical in effect. Perhaps a discussion of the ideas which seem to produce such pleasurable music on this and organs similarly conceived will stimulate further interest in what present-day builders of tracker organs are trying to do.

In considering the Oosthuizen organ as the first example, and one of the oldest available in the whole of Europe, certain links will be established between the past and present. Principles, or, more properly, self-imposed limitations, which apparently guided the thinking of most organ builders up until about the beginning of the nineteenth century, have once more been brought into focus by the modern organ builder. This does not mean that contemporary organs built in accordance with these principles are direct copies of ancient organs. Not at all. Actually, the ideas lie so deeply embedded in the soul of the instrument that they are without age or style. The proper tonal proportioning of an instrument, whether modern or not, depends to a large extent on the judicious evaluation of several important variables about to be discussed.

Any pipe organ has three distinct functional sections: (1) the wind producer and reservoir, (2) the operating mechanism, and (3) the pipes and organ case.



One Manual Organ at Oosthuizen, built in 1521.



Plan of One Manual Organ at Oosthuizen

In this discussion, the wind producer and reservoir have no place.

The two sections more important to our purpose are seen clearly in the design of the Oosthuizen case. This is no accident. The measurements of the skeletal case conform exactly to the internal requirements of the chest, pipes, and key and stop action. Or, looking from the inside out, the instrument is a wind chest and its pipes, around which a housing is built, plus a key and stop action with an ornamental enclosure.

While determining the dimensions of the wind chest, the builder must have had in mind many interrelated problems. The considerations of space, acoustics, and cost were, perhaps, foremost in first settling the size of the organ — in this instance, a one manual instrument without pedal, based on an 8′ Principal. The width and depth of the wind chest were influenced, no doubt, by the number of stops and their scales, the arrangement of the pipes on the chest, and the compass of the keyboard. The scales, in turn, were arrived at with a view to acoustics, specification, and wind pressure.

These considerations having been weighed one against another, the builder ascertained the width and depth of his organ case, which fit exactly around the sides and back of the wind chest. The Prestant pipes (praestare = to stand in front), being the longest, were placed on the front of the wind chest. A ceiling was created to follow this outline. The case, however, was not, and is not considered today, merely ornamental; it was essential to the focus and blend of the tone. And the particular type of voicing often spoken of today as "ancient," or "classic," depended, in part, for its success upon the enclosure of each separate division in such a case as has been described.

It has been stated that the various factors important to organ building depend a great deal upon one another. When the organ builder makes the key action for his instrument, he finds that the several conditions important to the success of the speaking parts are likewise important to a successful action.

The direct advantage of a good mechanical action lies in the tactile connection afforded to the player between the key and the pallet under the pipe. Not only does the finger control, to a degree, the speed of the opening of the pallet, and its closing (which, if electrically controlled, is invariably instantaneous and very snappy), but it feels the action of the pallet. This gives the player more control over timing than is possible with electric action.

Making a good mechanical (tracker) action for an organ, especially if it be a small one, is not as difficult as one might suppose. But, the ticklish problems concerned with the size and opening of the pallet, which depend, partly, on the dimensions of the key chamber, must be carefully weighed against related problems in key touch. An expert organ builder will have thought these problems through. He will have organized them into a set of convictions, from which he can draw the specific measurements for each individual chest he builds. And he will know exactly how certain variations in pallet size or wind requirements will react in the key, at the other end of the action.

A further advantage of mechanical action is implicit in the manner of voicing the pipes. While voicing with little or no nicking was certainly the technique of the builders of yesteryear, and was discarded during the nineteenth and twentieth centuries, this technique should still not be called the "ancient," or "classic manner of voicing." It is another of those features of organ building that defy fashion or style. For, if an organ builder will make an instrument with tracker action, he will discover that the pipes must be voiced in the way which is most advantageous to the key action and to the musical requirements.

As voicing determines the amount of wind necessary for speech of the pipes, the size of the pallet and other matters in chest construction proceed directly from voicing. In like manner, the adjustment of the key action is dependent on the size of the pallet and its aperture. The pallet opening should be no greater than the maximum comfortable key dip, namely, about 7/16"; in fact, if the pallet opens less than the key dip, a better action results, due to various losses of motion in the intervening mechanics. Here are some points of which the builder is mindful in this respect:

(1) Key chamber chests (usually slider chests) are essential both to the action and to the voicing of the pipes.

(2) Tracker action is possible only on low wind pressure, that is, 3 1/2", or less. This calls for a special development in voicing technique.

Speaking in general, it is important to give the pipes enough wind for proper speech, and not much more or less; the action of the keys must be responsive to the player's fingers, not too deep, not too heavy. Contrary to the opinions held by many, it is possible to build good tracker action organs of sufficient size to satisfy all reasonable requirements.

Before going on to the next organ examples, there is another interesting point worthy of notice. The drawing of the Oosthuizen organ shows, as we have pointed out, a one hundred per cent functional case. This is even demonstrated in the slanting in of the sides from the upper section to the narrower lower section. Behind these apparent supports for the main case, lies the rollerboard, an essential part of most mechanical actions. Rollerboards are used even for very small organs, in order to transfer the motion of the keys laterally to positions directly under their respective pipes. There are two reasons for this: (1) the larger pipes are wider than the keys, and cannot, therefore, be placed directly in line with them; (2) usually the organ builder prefers not to use a chromatic arrangement of pipes on the chest because a less orderly spacing allows for placing more pipes on a small surface. Thus, it can be seen that the rollerboard dictated the form of this case, as did the chest, scales, pipe arrangement and key and stop action.

The Oosthuizen specification of 1511 follows: 16′ Bourdon (originally 8′), 8′ Prestant, 4′ Octaaf, 2 2/3′ Quint, 2′ Woudfluit, II-III Mixtuur, II Sesquialtera (2 2/3′, 1 3/5′).

Travelling by car to the next three organs, all of which are in the eastern section of the country, the tourist will cross the famous twenty-mile Afsluitdijk, which closed off the old Zuider Zee in 1933, and made of it a huge fresh water lake. And he will drive through some of the new farmland (polder) created since that time from the lake bottom.

In order of size, we mention next a new (1951) instrument of the Flentrop Organ Company, with two manuals and pedal, in the Dutch Reformed Church at Groenlo. The specification is:

Hoofdwerk	*Boorstwerk*	*Pedaal*
8′ Prestant (from G)	8′ Holpijp	16′ Subbass
8′ Roerfluit	4′ Spitsfluit	8′ Prestant
4′ Octaaf	2′ Prestant	4′ Nachthoorn
4′ Quintadeen	1 1/3′ Quint	
2′ Vlakfluit	II Sesquialter	Pedaalkoppel
IV-VII Mixtur (1 1/3′)	I Cymbel	Manuaalkoppel
8′ Trompet	8′ Regaal	

Two Manual Flentrop Organ at Groenlo.

The photograph demonstrates that the three divisions of this instrument are made according to the principles described in relation to the small Positiv at Oosthuizen. The Hoofdwerk (Great) is in the center, with its 8′ Prestant on the chest in front; the Pedal on C and C♯ chests on either side, and the Boorstwerk (Brustwerk) under the Great at the head of the player. Of course, the organ is built as shallow as possible, and placed for best acoustical advantage on the west wall.

In an instrument such as this, with several divisions, the disposition of principal tone from the pedal 8′ to the Boorstwerk 2′ is traditional. The various divisions obtain their special character and individuality from this disposition, and the resultant sizes of the respective cases create different types of resonance for each division. It is, then, not only for the visual effect, but also for the resonance effect of the Great case, that the Great Prestant 8′ is not carried to low C. The Great case can, in this way, be made lower than the side cases for the Pedal (built for a complete Prestant 8′), and the sounds coming from the smaller case become more distinctive.

In Doetinchem, not far from Groenlo, is a three manual Flentrop organ, built on a 16′ Principal.

Hoofdwerk
16′ Quintadeen
8′ Prestant
8′ Roerfluit
4′ Octaaf
4′ Gedekt Fluit
2 2/3′ Nasard
2′ Octaaf
V-VI Mixtur (1 1/3′)
8′ Trompet

Boorstwerk
8′ Eikenfluit
4′ Fluit
2′ Prestant
2′ Gemshoorn
1′ Octaaf
II Cymbel (1/3′)
4′ Regaal

Rugwerk (Rückpositiv)
8′ Holpijp
8′ Quintadeen
4′ Prestant
4′ Roerfluit
2′ Octaaf
1 1/3′ Quint
IV Scherp (1′)
II Sesquialter
8′ Dulciaan

Pedaal
16′ Prestant
8′ Octaaf
4′ Octaaf
2′ Nachthoorn
IV Mixtuur (2′)
16′ Bazuin
4′ Schalmei
Two Pedaalkoppelingen
Two Manuaalkoppelingen

Again built according to the tenets already outlined, this instrument illustrates the advantages of cases constructed around Principals of various sizes: the Pedal in a 16′ case, the Great at 8′, Rückpositiv at 4′, and Brustwerk at 2′. From the individual resonance characteristics of each of these cases come natural differences in the sounds produced. Thus, the case dimensions and differences in specification contribute to a greater degree to the individuality of the divisions than do any differences in voicing or scaling.

The contract for a large organ in Zwolle was one of the last that Arp Schnitger signed. He died soon afterwards, and the instrument was completed (1721-1725) by his son, Franz Caspar. This organ, one of Holland's greatest organ monuments, is now being restored completely by the Flentrop Organ Company. The arrangement of the chests conforms, again, to the ever present rules of tracker action organ building. This can be seen in the photograph (excepting for the Brustwerk, which lies behind the Rückpositiv, away from the camera's eye), if the reader can visually strip it of its abundant baroque ornament. The main case is built on three levels, the Great on top, the Onderwerk next, and the Brustwerk at the head of the player; the Pedal is on either side, and the Rückpositiv at the player's back.

THREE MANUAL FLENTROP AT DOETINCHEM.

In the nineteenth century and the beginning of the twentieth, radical changes were made in the specification and pitch of the organ. These not only destroyed its tonal architecture, but made the action of its four manuals impossible to manage. The action was so bad that, at one time in this century, it was considered inevitable that the organ should be electrified. But, with the present restoration, the old specification and pitch (one whole note sharp) have been respected, and the action is, once more, entirely satisfactory. This may serve as proof of the interdependability of the various facets of organ construction, and of the fact that lack of respect for any of its parts always means disruption of the whole.

The specification of 1950, which includes all the changes since 1721, is given next to that of 1955, which is almost exactly the same as that of the completed instrument in 1721. Plans for the restoration were the result of the combined efforts of George Stamm, Adriaan Schuurman, D. A. Flentrop, and the Rijksorgelcommissie of the Netherlands. A picture of this organ appears on page 1.

1950 SPECIFICATION	1955 SPECIFICATION
Hoofdwerk	
16′ Prestant	16′ Prestant
16′ Bourdon	16′ Quintadeen
8′ Octaaf	8′ Octaaf
8′ Roerfluit	8′ Roerfluit
4′ Octaaf	4′ Octaaf
4′ Speelfluit	4′ Speelfluit
4′ Flauto Amabile	3′ Nasard
3′ Nasard	2′ Superoctaaf
2′ Octaaf	II Ruispijp
II Ruispijp	VI Mixtuur
III-V Mixtuur	III Cymbel
I-IV Cornet	16′ Trompet
16′ Trompet	8′ Trompet
8′ Trompet	8′ Vox Humana
4′ Trompet	
Rugwerk	
8′ Prestant	8′ Prestant
8′ Roerfluit	8′ Roerfluit
8′ Holpijp	8′ Quintadeen
8′ Quintadeen	4′ Octaaf
8′ Violoncel	4′ Fluit
4′ Octaaf	3′ Quintfluit
4′ Fluit	2′ Superoctaaf
2′ Octaaf	II Sesquialter
2′ Fluit	IV Scherp
16′ Bassethoorn	III Cymbel
8′ Hobo	16′ Fagot
8′ Vox Humana	8′ Schalmei (orig. Hobo)

Borstwerk (added by Joh. Geo. and Franz Caspar Schnitger, 1720)

8′ Fluitgedekt	8′ Fluitgedekt
8′ Holfluit, disc.	4′ Prestant
4′ Prestant	4′ Roerfluit
4′ Roerfluit	3′ Spitsfluit
4′ Salicionaal	2′ Octaaf
3′ Quintfluit	2′ Gemshoorn
2′ Prestant	1′ Nachthoorn (orig. Vlakfl. 2′)
2′ Gemshoorn	1 1/2′ Quint
1 1/2′ Quint	II Sesquialter
IV Mixtuur	IV Mixtuur
8′ Fagot	8′ Dulciaan
8′ Dulciaan	8′ Kromhoorn regaal (orig. Kromhoorn)

Onderwerk

8′ Prestant	8′ Prestant
8′ Bourdon	8′ Holpijp
8′ Flauto traverso, disc.	8′ Viola (added 1830)
8′ Viola	6′ Prestantquint
8′ Aeoline	4′ Octaaf
4′ Octaaf	4′ Holfluit
4′ Holpijp	3′ Quint
3′ Quint	2′ Octaaf
2′ Woudfluit	2′ Woudfluit
1′ Flageolet	1 1/2′ Sifflet
III Carillon	II Tertiaan
8′ Trompet	V Scherp
8′ Klarinet	8′ Viola di Gamba
	4′ Trompet

Pedaal

16′ Prestant	16′ Prestant
16′ Subbas	16′ Subbas
10 2/3′ Quintbas	8′ Holpijp (orig. Roerquint 12′)
8′ Octaaf	8′ Octaaf
8′ Holpijp	4′ Octaaf
8′ Violon	2′ Vlakfluit (orig. Ruispijp III)
4′ Octaaf	VIII Mixtuur
16′ Basson	32′ Fagot
16′ Bazuin	16′ Bazuin
8′ Trompet	8′ Trompet
8′ Trombone	4′ Trompet
4′ Cornet	2′ Cornet

W. L. SUMNER

ARP SCHNITGER

Part One

NO competent critic could refuse a place for Arp Schnitger in the first half-dozen of the greatest organ builders of the Western civilization. Many would give him first place. His organs represent the finest and most complete development of the high baroque age. The post of organist at one of his best organs was eagerly but unsuccessfully sought after by the great J. S. Bach in his maturity.

The name Schnitger or Schnitzer, a wood carver, gives a clue to the family profession. Arp's father and grandfather and other ancestors had been carpenters, joiners, cabinet-makers and wood-carvers in the North of Germany for many years. Another variant of the name used by Arp himself, particularly when he was dealing with church authorities in Holland and Friesland, was Schnittker, but the form used by Charles Burney, an unreliable historian, — Splitger — is wide of the mark. The Christian name Arp is probably a corruption of Arpad, the name of an old Hungarian king, but it might have been derived from Arps, the name of a Holstein family, or even from the German surnames Erpien and Erbsen.

Arp was born on July 9, 1648 in Schmalenfleth near Golzwarden in Oldenburg. His father was known for the beautiful carved-work on organ cases in Golzwarden. Arp's mother was called Catharina, and there is a record of the death of his sister on September 23, 1649. At the age of fourteen Arp began working, as a joiner and carver, with his father in Neuenfelde, a small town with which he was to be associated all his life. (There are three places of this name in North Germany. This Neuenfelde is south of Hamburg, in the Altes Landes and not far from the small town of Buxtehude.) Arp's first wife had real estate in this little town and brought it has a dowry. The "orgelbauerhof" at which he worked was her property. It is still preserved and bears a plaque which reads

Hof des Orgelbauers
Arp Schnitger
1648 — 1719

There is an Arp Schnitgerstrasse and an Organistenweg nearby, and the organ in the church is a typical two manual and pedal baroque of the great master. He and his family worshipped in this Lutheran church. It was not his original intention to give the organ, but when payment was tardy he presented the instrument to the church, as he did elsewhere on more than one other occasion. Schnitger's coat of arms with acorns, ears of wheat and dividers can still be seen, as well as the private boxed-in pew with glass sides which he and his family, as leading citizens of the place, occupied, on the right of the pulpit, above the altar. One can also see the tombs of Schnitger and his first wife in the same church. An account of the organ, given by Isa McIlwraith, appeared on page 17 of *The Organ Institute Quarterly*, Autumn 1954, and there is no need to say more now. The organ is jealously preserved, and being under official surveilance it is safe from the whims of temporary local custodians.

Schnitger was twice married. His first wife was Gardrudt Ottens. The wedding took place on February 3, 1684, and there were six children. The sons, Arp and Hans,

died comparatively young, but Hans Jürgen and Franz Caspar were destined to continue the business after the death of their father. (Baptismal records give the following dates: Agneta, February 5, 1685; Arp, April 22, 1686; Hans, May 14, 1688; Hans Jürgen, September 4, 1690; Franz Caspar, October 15, 1693; Catharina, November 8, 1697.)

Arp Schnitger died on July 24 or 25 in 1719 and he was buried in Neuenfelde on July 28. His second wife married Burgomaster Gerels of Oldenburg. The son, Franz Caspar, died in Zwolle in 1729 and Hans Jürgen (Johann Georg) died in 1734.

Both by his own genius and by the dowries of his wives, Arp was able to attain a position of eminence in North Germany, as a person and not only as an organ builder. He was a friend of Otto von Guericke, the burgomaster of Magdeburg, well-known in the history of physics for his experiments with the famous hemispheres to show the pressure of the atmosphere. Arp was keenly interested in the problems of pressing air, and, indeed, these were only beginning to be understood properly in England and Europe during his lifetime. Somewhat earlier Christian Förner (Förmer) of Wettin had discovered the water manometer for measuring wind pressure in the organ.

It is significant that Arp was born at the time that the last battle of the Thirty Years' War was being fought. The enormous progress which had been made in German organ building in the seventeenth century and which was faithfully recorded by Michael Praetorius (or Schulte) in the Second Volume of his *Syntagma* (*Organographia*) published in 1619, was held up by this devastating war. In thirty years Germany lost three-quarters of its population of 24,000,000, and whole cities, such as Magdeburg, were laid to waste. The old Hanseatic ports, such as Hamburg and Lübeck, with their sturdy Protestant independence, suffered less than many other places further inland. Organ builders left Germany and went to other parts of Europe. Even some decades after the end of the war there was little money for organ building; Bernard Smith came to England in 1660 to seek his fortune. Towards the end of the century the recuperative power of the Germans had shown itself, though it was not until the middle of the eighteenth century that general prosperity was to arrive. Some very bad work was done by dishonest, incompetent and hasty organ builders in the latter part of the seventeenth century. In order to warn clergy and organists against the poor work of these charlatans Andreas Werckmeister wrote his *Orgel-Probe* (*Organ Proving*) and the first edition selling out quickly, he published a second ("revised and improved") edition in Quedlinburg in 1698. Werckmeister was organist of St. Martin's Church in Halberstadt and regarded Schnitger, even as a young man, as the standard by which others of the same craft could be judged. In order to advertise his work and to show his credentials, Werckmeister printed a number of testimonials from leading organ experts at the front of his little book. All of these are in rhyme and the longest, in quite good doggerel, is by Arp Schnitger himself "Orgelmacher in Hamburg."

Schnitger must be regarded as the culminating point of an important period of development in the organ of the Northern countries of Europe. Schweitzer says of J. S. Bach "All things came to him." In a similar way Schnitger became the focal point of the finest developments in Dutch and North German organ building. His instruments show the baroque (bürgerlichen) style of organ building at its best. He built at the time of the "stadtisch-bürgerlichen period," a time when civic pride was resurgent in North German ports and towns. The possession of a good organ and organist was a matter of civic and ecclesiastical satisfaction and there was friendly rivalry between one

town and another. It is not surprising that we have listed 150 organs which he made, and there may be others. An organ which he exported to Russia became the favorite instrument of Peter the Great; the organ which he built in Charlottenburg Palace, near Berlin, was again the favorite organ of Frederick the Great.

Although Schnitger's apprenticeship with his cousin Huss (Huess) lasted four years, and Huss had built worthy organs at Gluckstädt and Meldorf, Schnitger had not been slow to learn from the fine renaissance organs of Hamburg and other Northern cities which had suffered little physically in the war. It often fell to Arp's lot to rebuild and repair the organs of the Scherer family, and in their instruments he carefully refurbished any pipe work which was usable. To this day ranks of Scherer pipes can be heard in the Schnitger organ at St. Jakobi, Hamburg. The chief members of this noteworthy family were Jakob Scherer (who worked from 1545 to 1565), Hans Scherer the older who built organs from 1570 to 1611, Hans Scherer the younger from 1590 to 1630 and his brother Fritz from 1605 to 1640. These are the dates during which they built notable organs, and it is no exaggeration to say that the majority of important organs in Hamburg, Lübeck, Lüneberg and other North German towns were repaired, rebuilt or built anew by one or other of them.* Lessons were to be learnt from the equally noteworthy Compenius family who built organs in Denmark, Germany and North Holland. To Schnitger these were old and respected figures and, without being an iconoclast, Arp wished to make his instruments up-to-date. It was from Gottfried Fritsche that he learnt of new voices and the remarkable innovations of the Dutch organ builders. The Fritsche family left Holland after the reformation and had settled in Germany. Gottfried had developed the Sesquialtera and was interested in producing reed-like tones from sets of flue pipes. The members of the Fritsche family were highly respected and were friends of the leading musicians of their time.

What are the principal characteristics of Schnitger's organ and how do they differ from those of Gottfried Silbermann whose work has been discussed in considerable detail in these pages? Schnitger was born about a generation before either of the Silbermanns, and before the Latin influence with its subsequent seeds of romanticism had spread rapidly in the work of the Southern builders. It is by no means certain that Silbermann understood the genius of the North German organ; certainly he never appreciated it. To understand the difference between the two conceptions of the ideal of an organ we must look into the historical development of the northern organ. The large, late renaissance and early baroque organ had developed by the bringing under one control the old large German Hauptwerk and Pedal organ, the smaller and more subtle Positiv, and on the top of the music rest, between the top keyboard and the Hauptwerk sound-board, the smaller Portativ. The Portativ developed into the Brustwerk (Breastwork), the Positiv became the Rückpositiv and was placed at the back of the organist and sometimes at the very edge of the organ gallery, or even overhanging it. The largest pedal pipes were placed in towers at the sides of the main Hauptwerk case. Sometimes the Brustwerk was enclosed by cupboard doors, which could have been used to make it a rudimentary Swell organ. Such a Swell effect was not necessary in the block or terrace dynamic of the time and would have been considered supererogative or even barbarous then.

*Some account of their work is given by the author in: *"The Organ: Its Evolution, Principles of Construction and Use."*

The Brustwerk often contained stops of regal type which easily got out of tune. Thus, the organist could adjust them without difficulty and often without leaving his seat. Werckmeister, in his book, says "Schnarrwerk is often the work of fools. But when it is pure and good, it rejoices heart and mind." ("Schnarrwerk" was the small reeds of "snoring" or "rattling" tone.) In large organs there was a space above the Hauptwerk pipes and behind the upper parts of the front pipes in the main case. Here the Oberwerk could be placed.

Schnitger was to bring to perfection the high baroque organ with its considerable resources. He retained the correct disposition of the sections of his organs in space, particularly with regard to the Rückpositiv, wherever this was possible. He also understood the pitch relationship between manuals and, ideally, the need for preserving the relations between the radiating areas of each section. These characteristic factors were often forgotten by Silbermann, who frequently enclosed his organ in a single case. The folly of doing this has often been pointed out by Albert Schweitzer, but few have followed him. The high baroque organ had stereophonic sound!

Schnitger's choruses, though versatile, were loosely constructed and resulted from the mixing of the sounds of ranks of differing pitch, distinctive tone and irregular scaling. The narrow-scaled (male) stops of principal tone were still separated in the registration schemes of the late seventeenth century from the wide-scaled (female) stops. Some of the wide-scaled stops had small mouths and were under-excited and so increased their tones and blended admirably when they were played with stops of sharper tone. The strict registration rules of the sixteenth century were no longer rigidly kept at the beginning of the eighteenth century, and it is well known that J. S. Bach was pragmatic in his registration schemes. In Schnitger's organs there was not only a distinction in the pitch, position, radiation areas of each of his manual and pedal sections, but each of his larger divisions contained families or choruses of stops. In the Silbermann organs, much of this versatility was to go. Everything was to be sacrificed for a smooth, sophisticated and well-knit chorus. Silbermann "put his goods in the window." There is no denying the magnificence of the Silbermann conception, but it is significant that when the German organ of the nineteenth century, with its hypertrophied romantic tonal schemes, had cloyed, and had failed to satisfy such scholars as Straube, Schweitzer and Jahnn, it was the Schnitger organ in Saint Jakobi, Hamburg to which they turned in 1922, even in its then neglected and somewhat mutilated state. In his Foreword to *Alte Meister des Orgel Spiels* (1929) Karl Straube says, in "a first attempt in our days to arrange for a baroque organ a number of works from the times of Arnolt Schlick (1512) on to that of Georg Bohm (1733)": "It is nearly a quarter of a century since the first volume of *Old Masters of the Organ* was published. The aim of its publication was then to draw the attention of German organists to the masterpieces of the pre-Bach period. An historical survey of musical evolution has done so much to enlarge and clarify our vision that it is no longer possible for the discerning mind to see only in the attainments of our own day the highest point in perfection. Every musical period has its own organic character from which result certain laws of form and expression, and the wish of today, rightly to comprehend all these factors, is greatly furthering the growth of misunderstandings. The realization that perfection is self-contained in any great art has led to the desire to try and reproduce it in all sincerity as it was originally conceived, and, in so doing, only to make use of means strictly in accordance with the conditions of the time. The organ of today, however,

has proved an unfit medium for conveying the serenity and grandeur of works which have their roots in religious belief.

Every organist, who aspires to something higher than indulging the senses in a mere mass of sound effects, must wish to express as truly as possible the genuine character inherent in the works belonging to the great period of organ composition. With this aim in view, Wilibald Gurlitt built, in 1921, the Praetorius Organ in the Freiburg University, while at the same time Günther Ramin, organist of the Thomaskirche, Leipzig, and Hans Henny Jahnn, discovering in 1922 in Hamburg the Jakobi organ called forth all the magnitude and richness of sound latent in the masterwork of Arp Schnitger."

The stop grouping of a Schnitger organ division is exemplified in the Hauptwerk of his organ at Norden, built in 1686.

Group I	*Group* II
16′ Trompete	16′ Quintadena
8′ Principal	8′ Rohrflöte
4′ Oktav	4′ Spitzflöte
2 2/3′ Quinte	2 2/3′ Nasat
2′ Oktav	2′ Gemshorn
VIII Mixtur	III Zymbal

An instrument built at the end of his life (1715 to 1718) in the Church of Saint Marien, Frankfurt-on-Oder shows the same idea but with foreign intrusions.

Hauptwerk		
8′ Prinzipal	16′ Quintadena	8′ Salizional
4′ Oktav	8′ Gemshorn	4′ Cornettin
4′ Traversflöte	4′ Rohrflöte	
2′ Superoktav	2 2/3′ Quinta	
V-VI Mixture	IV Scharf	
Rückpositiv		
8′ Quintadena	8′ Grobgedackt	8′ Gamba
4′ Prinzipal	4′ Flöt douce	8′ Trompete
2′ Superoktav	2 2/3 Quinta	4′ Singend röhrwerk
IV Scharf	II Sesquialtera	
Pedal		
16′ Prinzipal	16′ Trombone	16′ Subbass
8′ Violon	8′ Trompete	8′ Gedackt
4′ Oktav	4′ Schalmei	
2′ Oktav	2′ Cornett	
VI Mixtur		
Oberwerk		
8′ Oboe	8′ Gedacktflöte	8′ Vox humana
4′ Prestant	4′ Kleingedackt	
2 2/3′ Quinte	2′ Flageolett	
2′ Superoktav	1 1/3′ Superquinte	
1′ Superoktav		

CONSTRUCTIONAL CHARACTERISTICS OF SCHNITGER'S ORGANS

Schnitger used the hardest of oak and to a lesser extent well-seasoned pine. The wind trunks were of oak and were of rather small cross-sectional area. (It must not be forgotten that the contrapuntal music of the seventeenth century does not use as much wind as the "thick" harmonic music of the nineteenth century.) On the other hand, his schemes for raising the wind were always adequate. He favored "diagonal" bellows of length double the width and, in his large organs, 10 feet long by 5 feet broad.

The following are examples of his bellows:

St. Nicholas, Hamburg	67 stops	16 bellows	10′ x 5′
St. Nicholas, Berlin	40 stops	8 bellows	9½′ x 5′
Buxtehude Church	35 stops	6 bellows	8′ x 4′
Moorburg Church	14 stops	3 bellows	6′ x 3′

The wind fed into a wind box and reached the wind chests in a steady condition. It must not be thought that diagonal bellows were necessarily productive of unsteady wind or called for great skill on the part of the blowers. One pattern of bellows (really a feeder and reservoir combined) had an internal valve which opened when the top of the feeder was raised against the bellows weights, which were usually bricks or stones wrapped in paper. The bellows then closed and conveyed air into the wind channel. Wind pressures rose during the baroque period, but it is unwise to think that they were often less than 2 1/2 inches in the seventeenth century. It is difficult to know what exactly they were before Förner's invention, but by considering the weighting of the bellows or the method of blowing employed, pressures must have been at least 3″ in large organs. In the translation of Ernst Flade's fine book on the Silbermanns, which has appeared in previous issues of this publication, there has been a discussion of the scale employed for measuring wind pressure. (Vol. 3 No. 3 p. 39). This is pertinent to the present article. The *grad* or *degree* of wind pressure given on the water manometer was formerly thought to be .1 inch or 2.5 mm., but it is now known to be smaller than this. The grad is about a twelfth of the old French foot which was rather longer than our present foot. A grad is 32/350 modern inches, or .0915 inches. Generally, there was only one pressure throughout an organ. Here are a few examples.

See Volume 6 number 1 p. 28

Hamburg, St. Nicholas	31 grad
Berlin, St. Nicholas	36 grad
Flensburg, St. Nicholas	35½ grad

Werckmeister believed that no pressures in church organs should be less than 30 grad. A pressure less than this in anything but a chamber organ showed inadequate provision of wind! This fact might be remembered by those who believe that baroque organ building means "anything under 2 1/2" of wind." Schnitger made his wind trunks and wind chests of "wagenschoss" (wainscot) and examples are still extant in fine condition, more than two hundred and fifty years old.

At first Schnitger was content to repair and to make "spring chests" in which there were a valve (or pallet) and spring for each pipe. The Cosmae organ at Stade had such a chest for the Hauptwerk with 585 valves. It was adjusted in 1818 by the organ builder Wilhelmi and was working 270 years afterwards, just before the war; and it is probably functioning today. (It was a study of the old spring chest which enabled Walcker to "invent" and improve the ventil chest and develop it in mechanical, pneumatic and electrical forms in the nineteenth century.)

Later in his career Schnitger found the slider chest more stable and more convenient and then consistently made this type. It needed less repair and was more easy to make and to adjust. Schnitger used fir, oak, brass and iron in making his tracker actions. Most of his organs have no couplers, but coupling between one manual and another in some of his larger instruments could be effected by drawing one manual over another, by pulling two wooden or brass knobs in the key frame of the upper manual. His Pedal organs were generally better equipped tonally than those of Silbermann, but occasionally a "Pedal to Rückpositiv" was fitted.

The "naturals" of the manual keys were covered with beech wood, pieces of glazed pottery or ebony, and the "sharps" with bone or ivory. The fronts of the natural keys were often decorated with simple but elegant patterns. The length of a manual keyboard of forty-five notes was 26.5″, that of a "sharp" key 2.6″ and of a "natural" key 4.2″. The depth of touch of the different manuals varied between .75″ and .3″, and for the Hauptwerk was often so great as to be uncomfortable for modern methods of playing. The weight of touch varied between the manuals and was usually heavier on the Hauptwerk. Very varied "touches" were possible on the Brustwerk and the Positiv organs, and a skilful organist could exploit to the full the different initiation transients of the various pipe ranks.

The pedal claviers usually had twenty-five, twenty-six or twenty-seven keys and the width varied from 43.5″ to 46″.

Both the pitches of Schnitger's organs and the compass of manuals and pedals in the bass were determined to a considerable extent by monetary considerations. Schnitger's organs were usually built for civic authorities, the sturdy, independent burghers of the Protestant towns, and money was more scarce than it was in the mid-eighteenth century when the Catholic nobility of the South and middle of Germany would occasionally set aside large sums for an organ. To the uninitiated it comes as a matter of surprise to find that there is an enormous extra cost required to lower the pitch of an organ by a tone or to extend its compass downwards to a similar extent. Schnitger used less English tin than Silbermann, but for front pipes the finest tin was employed by him. German tin was not considered good enough in spite of the protests of those who asked that local industry should be encouraged. The tin was imported at considerable cost from Cornwall. We find slight differences in the Schnitger compasses from place to place. Usually the manual compass was from C to c^3 without bottom C♯ and D♯, which gave 47 notes. In his smaller organs F♯ and G♯ were also missing and there was sometimes the makeshift re-arrangement known as short octaves. The pedal clavier was oak and extended from C to d^1. As C♯ and D♯ were missing this gave twenty-five notes.

Everything was honestly and worthily made. Schnitger's motto for all his work, his "Leitspruchs," was "Alles zur Ehre Gottes."

(To be continued)

DERWENT M. A. MERCER

THE SCIENCE OF THE ORGAN FLUE PIPE

INTRODUCTION

THE organ flue pipe, in its present form, is several hundred years old, but it is only comparatively recently that it has attracted the attention of scientists. Even so, work devoted to explaining its functioning and giving physical reasons for voicing procedures has been sporadic, and even now the underlying facts about the behavior of the pipe are not well understood.

Certainly the uniform excellence of the products of the organ builder shows that he has no need of the scientist's assistance. The field is, admittedly, a difficult one; the eminent physicist of the last century, J. Clerk Maxwell, wrote of "that untrodden wild between acoustics and music, that Serbonian bog where whole armies of scientific musicians and musical men of science have sunk without filling it up." This paper is an attempt to outline what has been done on the problem; due to space limitations, the author has given a disproportionate amount of it to his own work, but the whole of the literature on the subject, as will be seen, is of tremendous interest.

TONAL ANALYSIS OF PIPES

When the author began an investigation of the problem a good deal of work had been done on analyzing the steady tones from different types of pipes. Nothing, however, had apparently been done on the change of tone of a single pipe as various voicing operations were carried out on it, and this appeared to be a subject well worthy of investigation, and well suited to modern sound analysis apparatus.

In general the results confirmed, quantitatively, the general impressions which have long been known to voicers — although it may come as a surprise to some to learn that an average diapason pipe has some twenty-four harmonics. For instance, Fig. 1. shows the comparison between the more important harmonics of a pipe before and after cutting up the mouth. (The strengths of the harmonics, on this and the next diagram, are shown in decibels; it is impossible here to detail these units, and it should simply be taken that the diagrams represent orders of magnitude.) A diagram of particular interest is Fig. 2, showing the difference in harmonic structure of a pipe before and after nicking. It has often been stated that the effect of nicking is to reduce the higher harmonics. What in fact happens is that an un-nicked pipe contains a lot of background "hiss" or "wind-noise," low in intensity, but spread over a considerable frequency range, and it is this which is reduced by the nicking process.

Further work was done on other problems, including an investigation of the initial tones of pipes, which are of such great musical importance. But it seemed unsatisfactory simply to examine the behavior of the pipes without an understanding of how they worked, and this led to another and most interesting stage of the investigation. To explain it and give the background, it appears best to study the historical development of the subject.

HISTORICAL DEVELOPMENT OF SCIENTIFIC WORK

Apparently the first scientific investigation that is extant was in 1826, but this is of little interest. The first real contribution came, appropriately enough from Cavaillé-Coll, in 1860, in his well-known paper on the speaking lengths of organ pipes. But in

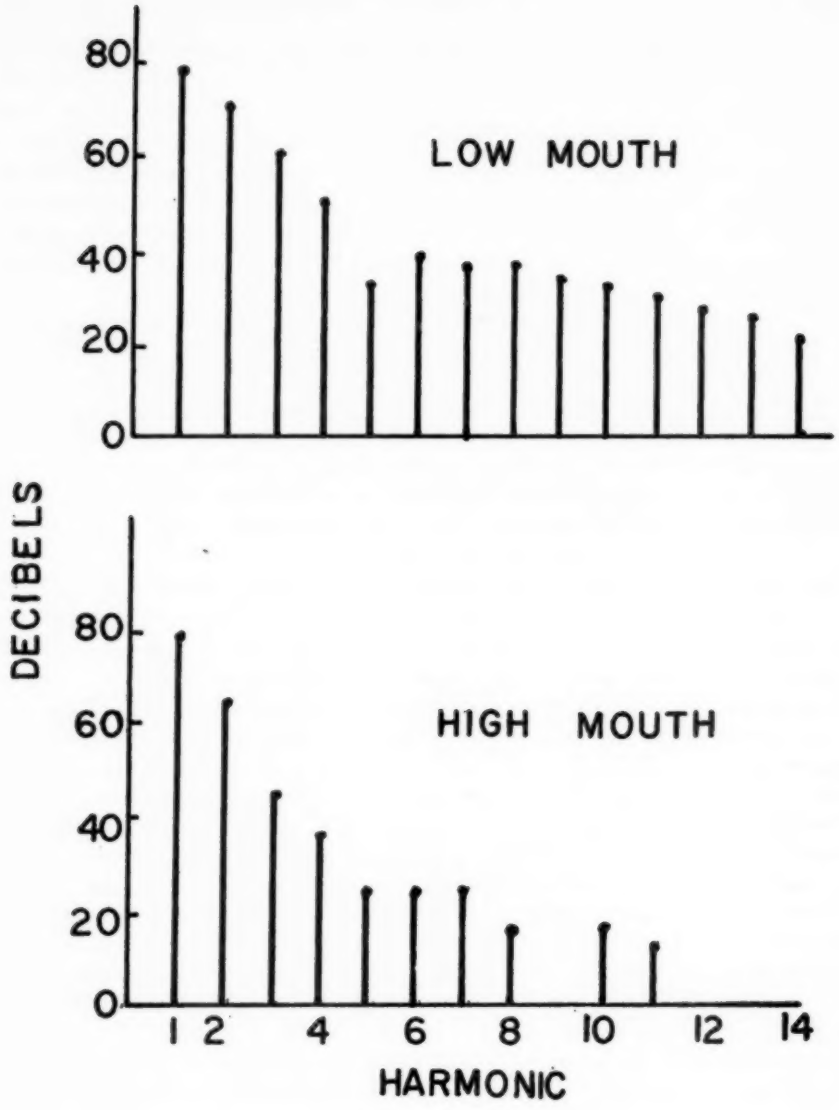


FIGURE ONE

this he refers to an earlier paper of his, read before the French Academy of Sciences in 1840, in which he says he first explained the action of the flue pipe by considering a "free aeriel reed" (anche libre aerienne). Most unfortunately, this paper was never published, and although the author has endeavored to trace it, it seems entirely lost.

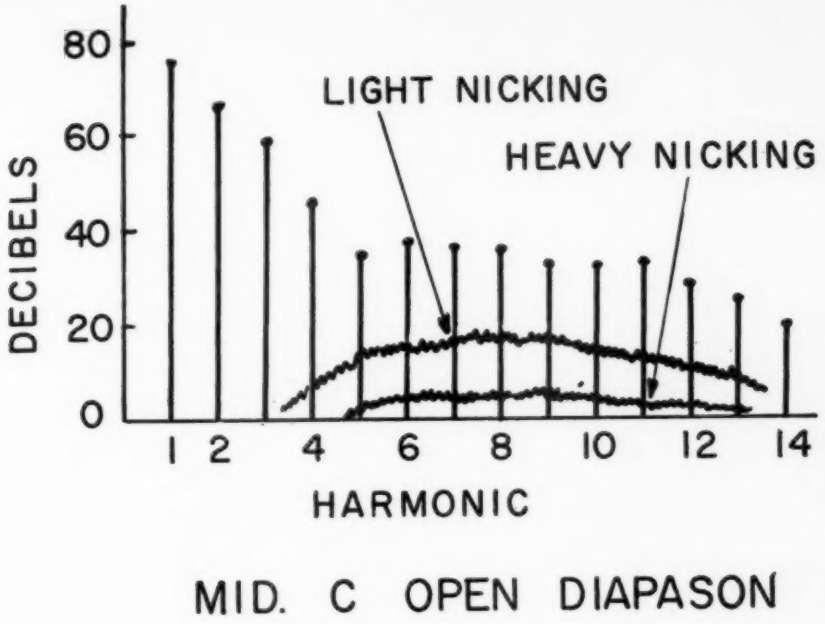


FIGURE TWO

Its loss is a tragedy; even in 1860 Cavaillé-Coll was anticipating all other workers, and it would be of tremendous interest to know more about his thinking and conclusions than this tantalizing fragment.

In the 1870's there were a number of articles published explaining the action of the flue pipe by an "air-reed theory." Briefly this may be described by saying that the stream of wind from the flue wavers to and fro into and out of the pipe, producing alternately an excess and deficit of pressure resulting in a musical tone, and to which the pipe body, functioning as a resonator, is tuned. It is difficult to say who originated this theory, but the fullest descriptions are given by Hermann Smith, an amateur scientist who knew a good deal about organ building practice by his contact with Thomas Lewis, the London organ builder. In a number of papers, submerged under a mass of rambling and irrelevant, although sometimes humorous, detail, there is a very consistent theory.

Probably the most complete scientific paper on the subject is a prize-winning essay by van Schaik. He introduced talcum powder into the windstream and examined by a stroboscope the air issuing from the flue, making wonderfully painstaking and accurate drawings of the vibrations he observed. (These investigations, incidentally, provide not only a fascinating study, but greatly impress one by the acuteness of observation and patient work of these early scientists, working entirely without our modern electronic apparatus.) The air-reed theory was adopted by the great Helmholz, and generally it held the field until the turn of the century.

Two other interesting investigations on rather different lines were, first, the work of J. G. Töpfer, who studied the tones of pipes of different proportions, and sought to

obtain numerical relationships between their scales, et cetera, and tones. This work was carried out in 1833 and is another fascinating study which cannot be detailed here; it culminated in the recommendation of the well-known one-to-the-square-root-of-eight scale ratio. An investigation was carried out in 1884 by Gerhardt on the Rohrflute; he reasoned correctly that this pipe, with its two resonating lengths, should be amenable to mathematical treatment, and his analysis of the tones it could produce is perfectly valid today and may be accurately applied, for instance, to a similar form of pipe, the Haskell bass.

Around the turn of the century, however, study was begun on the tones produced when air from a slit blew onto an edge, just like the upper lip of a flue pipe, without any resonator. It was found that the combination would produce tones, depending on the wind pressure and the slit-edge distance. By further examining the blowing air, it was found that regular trains of vortices were formed. This work was followed up, and has become the basis of the theory generally accepted today. It is that the "edge tone" produced by this combination is close to the natural resonance frequency of the pipe body, which thus draws the edge tone to its own frequency, and causes the pipe to speak.

EXAMINATION OF THE EDGE TONE THEORY

One defect of this theory, which in fact it shares with the air-reed theory, is that it does not explain the initiation of the tone. But on closer examination further difficulties appear. The author tested, for example, removing the upper part of the body of a pipe, leaving only the upper lip. When first tried, this combination would not speak at all, but it was found that by pressing the languid down a considerable way, tones were certainly produced. The really important point, however, is that they were higher, by some two octaves, than the normal frequency of the pipe, and this seemed an excessive amount for the edge tone to be "drawn."

Further investigation showed that the normal pipe frequency could certainly be produced, but only by using an excessively low pressure (or closing up the foot hole). The pipe body was then soldered on again, and the pipe blown at these low pressures. Then a surprising fact emerged — on very low blowing pressures the pipe was mostly silent, but at critical pressures, corresponding almost exactly with those causing the edge tone arrangement to give the pipe frequencies (i.e. fundamental or harmonics) — there was suddenly produced a soft tone. Such tones were immediately recognized as those produced when, e.g. a pipe is on a faulty soundboard, and "murmurs" due to a running in the upper boards.

A more complete investigation showed that on gradually increasing the pressure from zero upwards, a series of such tones were produced, but very weak compared to the normal tone. As the blowing wind was further increased, the normal tone began to emerge, and build up in strength; but this was at such pressures that the equivalent edge tone was far above the frequency of the pipe.

The conclusion appears to be inescapable. The edge tone theory certainly accounts for some action of the pipe — but only that far below its normal speech. The critical values of the pressures for which these murmurs could be produced shows that the edge tone can be drawn only a very small amount. Finally, the normal speech of the pipe is evidently due to an entirely different mechanism.

It is not very satisfactory, however, to knock one theory down without putting another in its place. A clue appeared to be possible when considering the windstream

from the flue. All the older writers on the subject speak of it as being easily deflected; Helmholz speaks of its being "wafted," presumably similar to a candle flame. But in fact it is a much more stubborn thing; it is moving at something like 60 miles per hour, and offers considerable resistance to being deflected.

Further, it should be realized that a stream of air blowing into air behaves differently from, say, a jet of water. It drags air from around it very readily, and soon loses its identity. It began to appear that here was a clue to the mechanism of the pipe, and the following explanation appears to fit the facts.

The windstream, as stated above, is directed well out of the pipe. In blowing past the upper lip, it sucks air out through the mouth of the pipe, thus producing that lowering of pressure which is the first part of the sound production. There is then a resultant pressure acting, tending to force the windstream into the pipe; ultimately it blows in, raises the pressure immediately inside the mouth, and then swings back to its initial position, to begin the cycle over again.

Such a theory, therefore, satisfactorily explains the intitation of the sound. It also explains why, for instance, the set of the languid is so critical. If the windstream blows out too far, it will not be able to suck air from inside the pipe, and the cycle will not start; if it is directed too far in, it will tend to blow inside the pipe, and again nothing will happen. It may be mentioned that the subject is one which is not at all amenable to mathematical treatment, but by making a number of approximations, the action mentioned above may be checked quantitatively, and it can at least be said that the results indicate the right order of magnitude.

Other facts, well known to voicers, can also be explained. Consider the phenomenon of a pipe overblowing when the pressure is too high. This can be explained by the fact that the fast-moving windstream sucks out air so fast that it can maintain a cycle twice as fast as the natural frequency of the pipe, and one to which the pipe will respond and maintain the action. What does the voicer do to stop overblowing? He may reduce the pressure, cut up the upper lip, or raise the languid; it will be seen that all these are in the direction of reducing the rate at which the jet sucks air out of the pipe, thus slowing the cycle of operations.

The effect of nicking may also be explained by this mechanism. We have been considering the jet as blowing bodily in or out of the pipe; but this assumes that the flow is streamline. Natural flow is often far from streamline, particularly when, as here, the flow has an abrupt edge (i.e. the sharp lower lip and languid). There will be little eddies and turbulence in the windstream, which will mean that air enters the pipe under the upper lip in an irregular way, causing the random noise mentioned earlier. But if the pipe is nicked, the sharp transition of the flow is reduced; a little air is "bled" into the edges of the flow, it becomes smoother, and the eddies tend to disappear, thus giving a more regular action.

CONCLUSION

It is possible here only to tell a very small part of the story, but it is possible on this theory to explain a number of facts well known to voicers. The credit really goes to the investigators of the nineteenth century, and their extraordinary acumen. Had they had access to the analyzing apparatus of today, fast, automatic, and amazingly more sensitive than any human ear, there is no doubt that the organ flue pipe, which even now presents many problems, would be a subject well on the way to complete explanation.

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NUMBER Three in this set of pieces, "If Thou But Suffer God to Guide Thee," is remarkable not only for its intrinsic interest and fine effect, but also because it seems to be a rare example of a composition that is better in its transcribed form than in its original version. While it must be admitted that the full panoply of color and articulation involved in performance by two female voices (upper manual parts), cellos and contrabasses (lower manual part), with harpsichord harmonies in the background, and unison violins and violas coming in at intervals with each successive line of the chorale melody, as in performances of Cantata 93, affords an impressive and dramatic utterance of the notes, still it may be felt that the more passive, inflexible tones of the organ afford greater clarity, and hence allow the various melodies, with their marvellous interplay of consonance and dissonance, to speak for themselves more eloquently. When sung, the upper parts are much more actively articulated, but they are also less well sustained, since they are for the most part syllabic (one syllable for each note), and because of the natural vibrato in voices. From the standpoint of rhythm the original version is probably superior, but the melodies and harmonies become more effective when smoothly sustained by the organ.

Whereas in Number One, "Wake, A Voice Is Calling," the left hand part is often quite close to the pedal part, sometimes leaving wide gaps between it and the right hand part which in the original version were occupied by the lightly played chords of the harpsichord, in Number Three the spacing of the four parts is ideal for the organ, the harmonies are more complete, and the absence of the harpsichord is no detriment.

The fifth, sixth, and seventh measures after the repeat sign have always seemed to the author to represent the very essence of Bach's polyphony, because of the supremely independent manner in which the four parts move through a series of dissonances, each one justifying itself and its rough contact with its neighbors by its own melodic interest. These measures present difficulties to all but the most musicianly singers, but they are quite natural to the instrumental medium.

Because of the crossing of the upper parts in this passage and elsewhere, it has sometimes been suggested that a performance on three manuals, pedalling the left hand part, dividing the right hand part on two manuals, and thumbing the chorale melody, should be undertaken. Although this method of performance would make the crossing of the upper parts clearly distinguishable, it would increase the difficulty disproportionately, as this piece clearly calls for an energetic performance at from 88 to 92 quarter notes a minute, in order to achieve its full dramatic effect.

It is quite difficult enough to play on one manual, as planned by Bach, at this tempo, if the principles of good voice leading are fully observed. Repeated notes should be abbreviated by half their time value, and moving notes should be legato, always excepting the last note of a phrase pattern. Syncopated notes should be accented by shortening their immediate predecessors. This applies especially to the quarter note A♭ in the right hand part at the second ending, the quarter note C in the following measure, and all similar recurrences of this figure. The little turn, consisting of two six-

teenths and an eighth, which usually follows this syncopated note, may be treated as the phrase ending, separating it from the ensuing pattern by shortening the eighth note. Other phrases may be determined by reference to the opening figures in each part, figures occuring after rests, those treated sequentially, harmonic and melodic cadences, upward leaps of a fourth, long notes and repeated notes.

Note patterns must be executed with similar phrasing in all the parts. The lower right hand part is difficult in this respect, because an almost irresistible temptation to use the thumb for successive notes will produce noticeable defects in legato. Sixteenth note figures sometimes require assistance from the left hand for at least one note, notably in measures 14, 16 and 21 (counting the second ending as measure 17).

For the manual parts, an 8′ Gedeckt and 4′ Principal may be found to be effective, with or without a 2′ flute. If the 4′ Principal is too loud, a 4′ Spitzflute might be bright enough. If 8′, 4′, and 2′ Flutes only are used, either a Cymbel (not too loud) or a 2 2/3′ Nasat might be added for color and definition. The chorale melody in the pedal part should be played on a Trompette, Clairon or Rohrschalmei, at 4′ pitch, or on the traditional 4′ Choralbass, if its tone is sufficiently distinguishable from the manual parts.

"My Soul Doth Magnify The Lord," Number Four, is based upon the psalm tone known as "Tonus Peregrinus" ("Wandering Tone"). Psalm tones being mere formulae for the musical recitation of psalm verses and other sacred texts, this one derives its name from the fact that it moves from one dominant, or reciting note (A) to another (G), at the half vèrse. All other tones use the same dominant throughout each verse. For many who are unfamiliar with the entire Gregorian system this tone seems to contain the essence of modal music, although it came as a very late addition to the main, original body of plainchant. It was traditionally used for chanting the Magnificat.

With the development of instrumental music in the seventeenth century, instrumental rhythms, which were derived from the dance, invaded the church, and the bar line separating measures of equal length established itself in vocal music. Many of the

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old tunes and chants, including this one, were recast in the new instrumental rhythmic patterns, and the older free rhythms, derived from words, disappeared. Although there was a gain so far as contrapuntal harmonization is concerned, the melodies themselves lost much of their interesting character. The free rhythms of plainsong lend the highest degree of interest to melodies. In them groups of three notes and two notes are freely intermingled, and accents occur irregularly. An interesting and easy comparison between the irregular rhythms derived from plainsong and the monotonous regularity of "instrumental" patterns may be made by playing (or better still, singing) *Freu dich sehr*, as published for hymns 61, 401, and 419 in *The LutheranHymnal*, Concordia, 1941, and Schumann's version of it, Number Four of the piano prelude, complete with a metrical *Young*. The tune which is the subject of this chorale prelude, complete with a metrical version of the text of the Magnificat (in German), is but a pale and anemic successor to the original latin recitation to Tonus Peregrinus. Nevertheless, the key to its interpretation is to be found in an understanding of the character, of "flavor," of the older chant. There is ample evidence the Bach was well aware of the powerful effect of the original form, and that he sought to re-create this character within the limitations of the metrical and tonal conventions of his day. This is shown by his prolongation of the second reciting note (G repeated four times, occuring five times in succession), by the reiteration of entire phrases one tone lower, and by frequent modulations through a whole tone, thus emphasizing the "wandering" idea.

Keeping in mind the solemnity of the original chant, a tempo of no more than 92 or 96 eighth notes a minute should be chosen. For registration, the solo may well be played on a single flue stop or combination of flue stops that is more intense than that used for the lower voices, as for example an 8′ Geigen and 4′ Flute, accompanied by 8′

Gedeckt and 4′ Flute, with a light 16′ and 8′ Pedal, preferably entirely independent of both manual combinations. If the solo is not made sufficiently prominent in this way, a 2 2/3′ Nasat combination may be used, based upon an 8′ Gedeckt or String, with or without a 4′ Flute. The object should be to make the solo only a little more prominent and only slightly different in color, but more intense.

In Cantata Number 10, however, the chorale melody is assigned to the trumpet and oboes, in unison. They are obliged to contend with alto and tenor solo voices; cello and contrabass, and harpsichord, in order to predominate. Here again, as in Number Three of this series, the more passive speech of organ pipes may be felt to be more effective than fluttering solo voices and the more articulate orchestral instruments. The smoothness of organ tone seems appropriate to the comtemplative mood of this piece. The organ arrangement is admittedly inferior in those passages where the parts cross. Voices reveal the true course of the melodies in such places, greatly enhancing their effectiveness. Some organists feel that this is sufficient justification for playing each of the voice parts on separate manuals, and thumbing the main melody on an intermediate or lower keyboard. Bach evidently did not consider this necessary. In his arrangement, however, there are three places where the right hand must play on two manuals at the same time. In measure 13, (counting the first, incomplete measure as 1) C, C, B♭ of the left hand part require the assistance of the right hand, as do C, B♮ in measure 24, and B♭, A in measure 26.

In measure 23 the two appogiaturas, together with their succeeding eighth notes, should be played as four sixteenths, E-D-C-B♮.

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The words sung to this music in the cantata are "He remembering His mercy hath holpen his servant Israel." A quiet meditation upon the boundless goodness of God was obviously the composer's intent; this is not only well within the limitations of our instrument, but a musical function that is highly appropriate to it.

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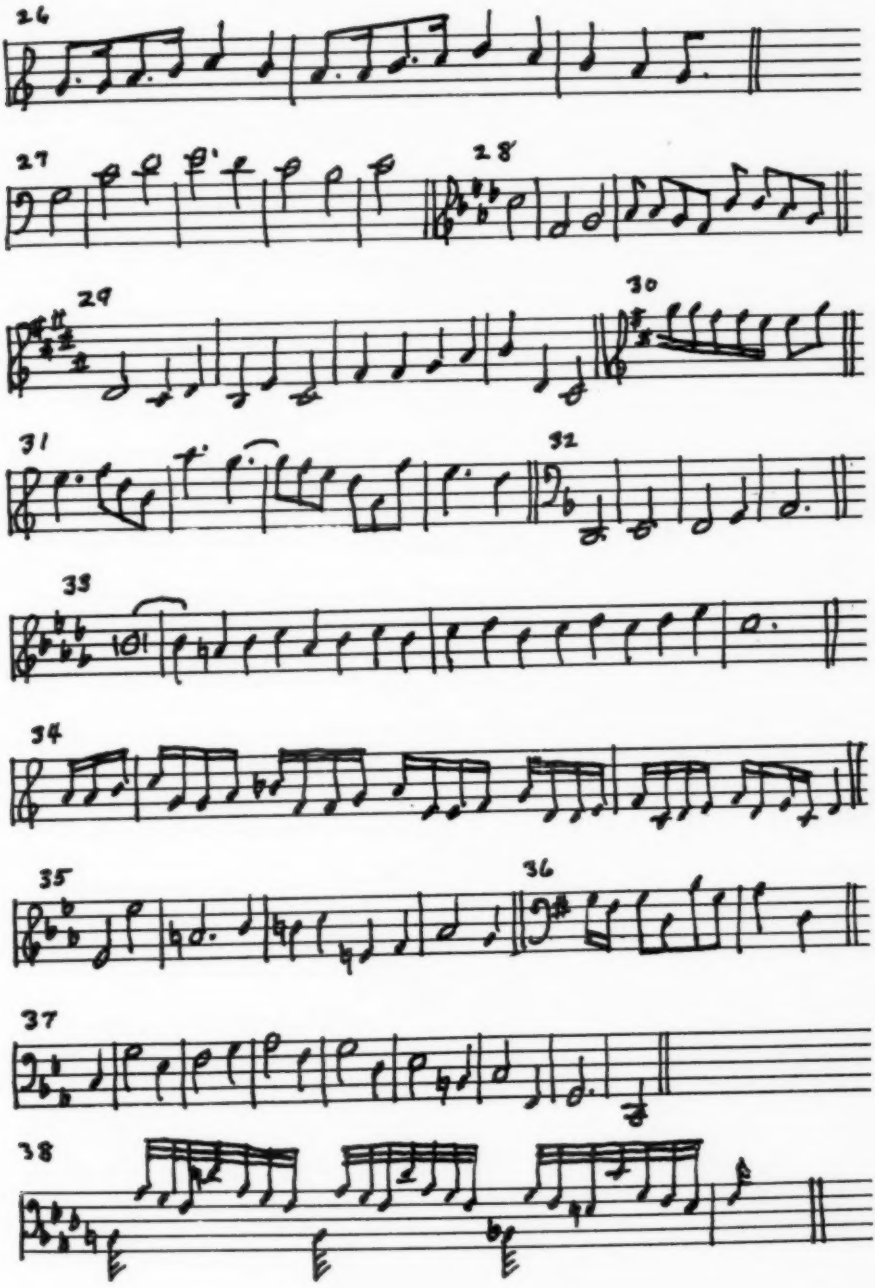
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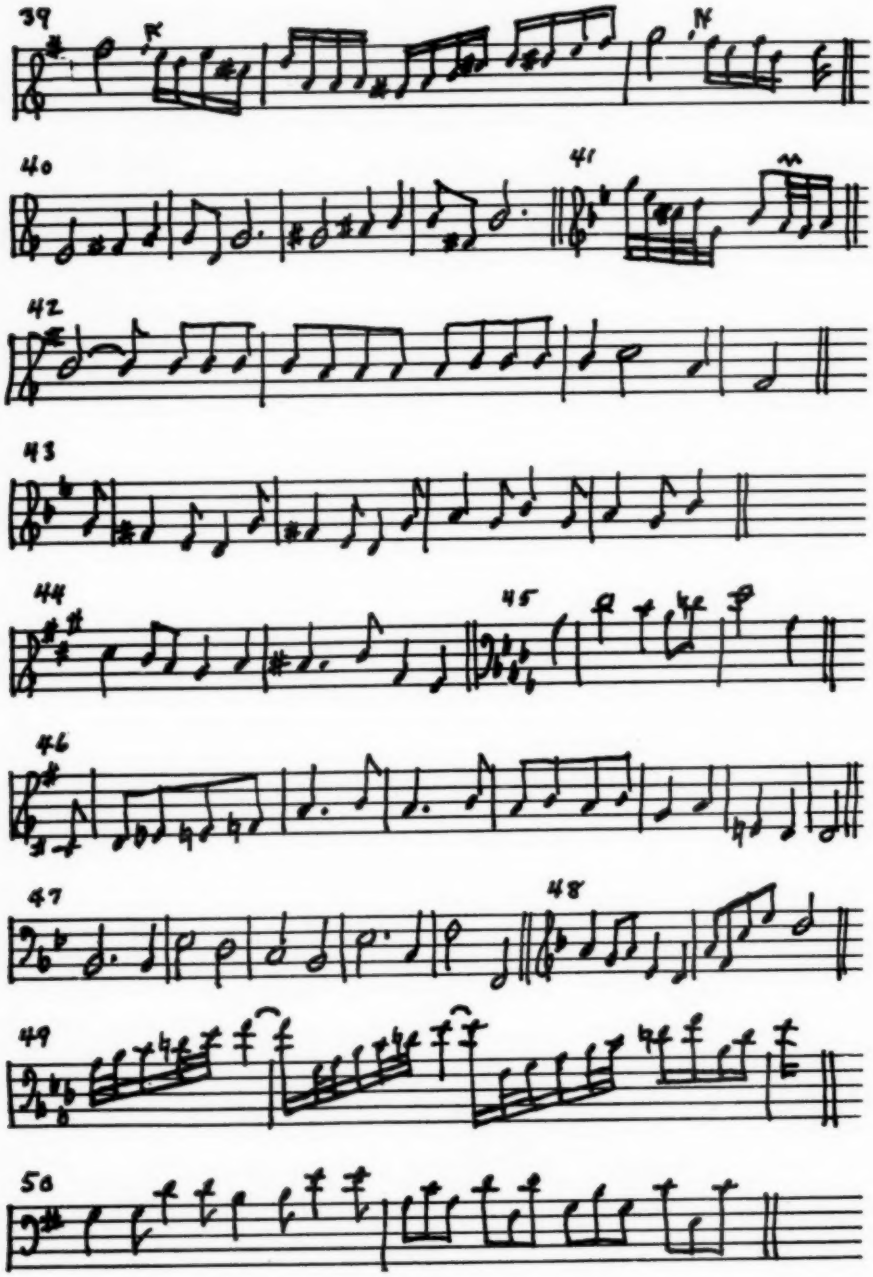
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Read everything on this page carefully.

RULES

Contestants will attempt to identify correctly the musical themes and fragments appearing on pages 57 and 58 of this issue, and a second set which will be published in the Spring issue. All of these items have been extracted from organ compositions of various periods and schools or other well-known pieces of music that are among the most frequently performed in their respective categories. List them in numbered order by composer, title, movement (if necessary), and measure or section. (If the theme appears more than once exactly as quoted, indicate the measure of its earliest appearance.) Identification of the first set of themes and fragments must be mailed to the Organ Institute and postmarked not later than March 9, 1955. The second set must be postmarked not later than May 30, 1955. A complete list of correct answers has been filed in a safety deposit box and will be available to the judges only. The decision of the judges will be final. The judges reserve the right to withold the first prize if no contestant receives a sufficiently high score.

In the event of a tie, a third set of themes will be mailed to the tied contestants as soon as possible after the final date for receipt of the second set. If this should fail to break the tie, then (and then only) the earliest date of receipt of all three sets of answers will be taken into account to determine the winner.

PRIZES

First Prize, $400. If the winner chooses to accept this prize as part payment of his expenses on the Organ Institute tour of European organs, described on page 9, it will be increased to $500.

Bonus Prizes. If the winning contestant obtains *new* subscriptions to the *Organ Institute Quarterly,* prior to the contest closing date, totaling five years or more (as one three-year subscripiton, and two one-year subscriptions) the First Prize if awarded to him will be increased by $25.00. Additional bonuses of $25.00 will be added to the First Prize for each additional five years of *new* subscriptions obtained by the contestant (provided these subscriptions, together with payment for them, accompany answers) up to the amount of $100, representing twenty years of *new* subscriptions, and making the total First Prize $500. If the First Prize and bonus are accepted as payment of expenses on the Organ Institute tour of European organs, bonuses awarded for *new* subscriptions, as described above, will be $100 for each five years subscriptions sent in with the first set of answers, and $100 for each five years subscriptions accompanying the second set of answers, with the further provision that if ten years or more of *new* subscriptions have accompanied the first set of answers and ten years or more of *new* subscriptions accompanies the second set of answers, the bonus for the last five years subscriptions, which brings the total subscriptions to twenty years or more, will be $165, this making the total First Prize and bonuses award $965, the exact cost of the all-expense Organ Institute tour of European organs. The bonus awards will not be made for more than twenty years new subscriptions in any case.

Second Prize, $100. If the winner chooses to accept this prize as part payment of his expenses in attending the 1955 Summer Session of the Organ Institute it will be increased to $150.

Bonus Prizes. If the contestant obtains five years or more *new* subscriptions to the *Organ Institute Quarterly,* a bonus of $5.00 will be added to the Second Prize under the same terms and conditions as outlined above under the First Prize Bonus, up to the amound of $20.00, representing twenty years or more of *new* subscriptions. If the second prize and bonuses are accepted as payment of expenses in attending the 1955 Summer Session of the Organ Institute the bonuses will be increased to $10.00. If two five-years of *new* subscriptions are mailed in on each of the two dates as described above for the maximum First Prize Bonus, the award for the final five-years of new subscriptions will be $20.00, making the total Second Prize and Bonus $200.00, enough to pay all expenses at the Organ Institute Summer Session. Here, as above, bonuses will not be paid for more than twenty years of *new* subscriptions.

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I have read carefully and understand all of the above rules and conditions and accept them completely and finally. I wish to enter the contest and enclose my typed (or printed) identification of the twenty-five themes and fragments published in the Spring, 1955 issue of the *Organ Institute Quarterly.*

I enclose names and addresses of ..... new subscribers to the *Organ Institute Quarterly,*

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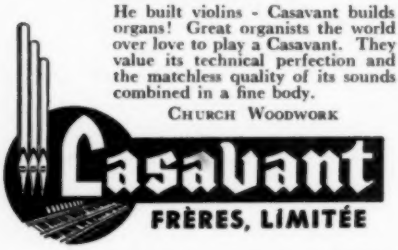

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